FIRESAFE FT Graphite

INSTALLATION INSTRUCTIONS

Date: 6th of September 2016
Rev.: date: 5th of March 2021
Rev.: 5
Prepared by: PP
Approved by: AK

Approval: ETA - 16/0094
DoP: FIR/PP/GRA-01-08 2016
CE 0960

PRODUCT DESCRIPTION

FIRESAFE FT Graphite is a special product suitable for penetration sealing of combustible installations.
Firesafe FT Graphite is a heat-expanding, one-component water-based graphite joint sealant. The sealant expands at a temperature as low as approximately 180°C. The product thus has very good fire stopping properties.

AREAS OF APPLICATION

- Penetration sealing of copper and steel pipes with combustible and non-combustible pipe insulation.
- Penetration sealing of pipes of the type AluPEX with combustible and non-combustible pipe insulation.
- Penetration sealing of plastic pipes of the type PE-Xa with combustible and non-combustible pipe insulation.
- Penetration sealing of plastic electrical cable conduit
- Penetration sealing of electrical cables.
- Penetration sealing of combustible heating/water/sanitation plastic pipes. See further explanation on the last page.
- PVC + PVC-C + PVC-U poly vinyl chloride.
- PP-MD noise-dampened.
- PP-R high pressure + high temperature pipe.
- PP-Polypropylene.
- PP-MX noise-dampened.
- PE-Xa high pressure + high temperature PE pipe.
- AluPEX heating + water supply, Al composite pipe or multi-layer pipe
- PE-LD + PE-HD polyethylene.

FIRESAFE FT Graphite is generally used for single installation penetrations with a maximum opening ≤ 15 mm between the installation penetration and the structure. For openings ≥ 15 mm between the installation penetration and the structure, or for multiple installation penetrations, FIRESAFE FT Graphite is used in combination with FIRESAFE FT Board or FIRESAFE GPG MORTAR. See installation details on the following pages in these installation instructions or see also the installation instruction for FIRESAFE FT Board for details.

CERTIFICATION/ FIRE RESISTANCE/ ARTICLE NO/ EL- NO

- FIRESAFE FT Graphite has been tested according to NS-EN 1366-3 (2009) and EN 13501-1/2.
- Certified according to ETA-16/0094
- Fire resistance EI 30 to EI 240 with extensive areas of application for walls and floors.
- Fire-classified walls according to EN 1363-1: Plasterboard or masonry/cast construction (density 600 - 650 kg/m^3) ≥100 mm.
- Fire-classified floors according to EN 1363-1.: Floors of masonry/cast construction (density 600 - 650 kg/m^3) ≥150 mm.
- Approved as a smoke sealant in accordance with EN 1634-3.
- For more details, see the DoP on www.firesafe.no.
- Article No: 100046
- El- no: 1217813

APPLICATION

- Ensure that any openings to be sealed with Firesafe FT Graphite are free from dust and grease.
- Treat absorbent materials with water or primer first.
- Fill the opening with backing material (stone wool, ceramic fibre or PE board) where necessary.
- Smooth the sealant over the opening; for straight edges, use masking tape.
- The sealant can normally be over-coated after 24 hours.
- Firesafe FT Graphite must not be applied at temperatures lower than +5 °C.
- The sealant is applied using a sealant gun and a standard sealant finishing tool.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

SEE FIRE RESISTANCE CLASS AND INSTALLATION DETAILS ON THE NEXT PAGES.

TYPE OF PENETRATION:	FIRE RESISTANCE CLASS:	DETAILS:	PAGE:
Plastic pipe type PE/PP/PVC ≤ Ø 110 mm. Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.	**EI 90**	Figures 1–2	**4**
Plastic pipe type PE/PP/PVC ≤ Ø 90 mm. Examples FIRESAFE GPG MORTAR and FIRESAFE FT BOARD Flexible and rigid wall ≥ 100 mm.	**EI 120**	Figures 3–4	**5**
Plastic pipe type PP-R ≤ Ø 110 mm. Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.	**EI 60 - EI 240**	Figures 5–6	**6**
Plastic pipe type PP-R ≤ Ø 110 mm. Rigid wall ≥ 150 mm.	**EI 60 - EI 240**	Figure 7	**7**
Plastic pipe type PP-MD ≤ Ø 110 mm. Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.	**EI 60 - EI 240**	Figures 8–9	**8**
Plastic pipe type PP-MD ≤ Ø 110 mm. Rigid wall ≥ 150 mm.	**EI 180 - EI 240**	Figure 10	**9**
Plastic pipe type PP-MX ≤ Ø 110 mm. Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.	**EI 90 - EI 240**	Figures 11–12	**10**
Plastic pipe type PP-MX ≤ Ø 110 mm. Rigid wall ≥ 150 mm.	**EI 90 - EI 240**	Figure 13	**11**
Uninsulated plastic pipe type PE-X Ø 54 mm. Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.	**EI 120 - EI 240**	Figures 14–15	**12**
Plastic pipe type PE-X Ø 25 mm insulated with polyolefin. Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.	**EI 120 - EI 240**	Figures 16–17	**13**
Plastic pipe type PE-X Ø 54 mm insulated with polyolefin. Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.	**EI 90**	Figures 18–19	**14**
Plastic pipe type PE ≤ Ø 110 mm insulated with synthetic rubber. Flexible and rigid wall ≥ 100 mm.	**EI 60**	Figure 20	**15**
Plastic pipe in bundle type PE-X insulated with polyolefin and electrical cable conduit. Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.	**EI 120 - EI 240**	Figures 21–22	**16**
Plastic pipe in bundle type PE-X insulated with polyolefin and electrical cable conduit. Flexible shaft wall ≥ 75 mm.	**EI 60**	Figures 23–24	**17**
Aluminium pipe type aluP-EX Ø 16 mm insulated with glass wool type ISOVER ClimPipe Section Alu2. Flexible and rigid wall ≥ 100 mm.	**EI 120**	Figure 25	**18**
Aluminium pipe type aluP-EX ≤ Ø 75 mm insulated with glass wool type ISOVER ClimPipe Section Alu2. Flexible and rigid wall ≥ 100 mm.	**EI 120**	Figure 26	**19**
Aluminium pipe type aluP-EX Ø 16 mm insulated with glass wool type ISOVER ClimPipe Section Alu2. Rigid wall and rigid floor ≥ 150 mm.	**EI 240**	Figure 27	**20**
Aluminium pipe type aluP-EX ≤ Ø 75 mm insulated with glass wool type ISOVER ClimPipe Section Alu2. Rigid wall and rigid floor ≥ 150 mm.	**EI 240**	Figure 28	**21**
Copper and steel pipe ≤ Ø 15 mm insulated with glass wool type ISOVER ClimPipe Section Alu2. Flexible and rigid wall ≥ 100 mm.	**EI 120**	Figure 29	**22**

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

SEE FIRE RESISTANCE CLASS AND INSTALLATION DETAILS ON THE NEXT PAGES.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Plastic pipe diameter ≤ (Ø) 110 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Plastic pipe type PE/PP/PVC ≤ Ø 110 mm, pipe wall thickness (t): 2.7 – 10 mm. U/C + C/C.				
Plastic pipe type PE/PP/PVC ≤ Ø 110 mm in wall. Pipe wall thickness (t): 2.7 - 10 mm. Max. opening in wall: Ø 130 mm	10 x 25 mm	With or without backing	**EI 90**	**Figure 1**
Plastic pipe type PE/PP/PVC ≤ Ø 110 mm in floor. Pipe wall thickness (t): 2.7 - 10 mm. Max. opening in floor: Ø 140 mm	15 x 25 mm	With or without backing	**EI 90**	**Figure 2**

Figure 1
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

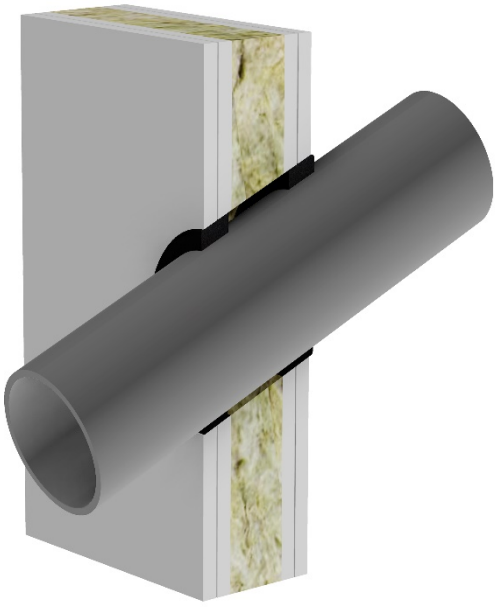


Figure 2
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes

C/C: Capped /Capped. Closed /Closed, closed pipe systems with permanent water pressure.

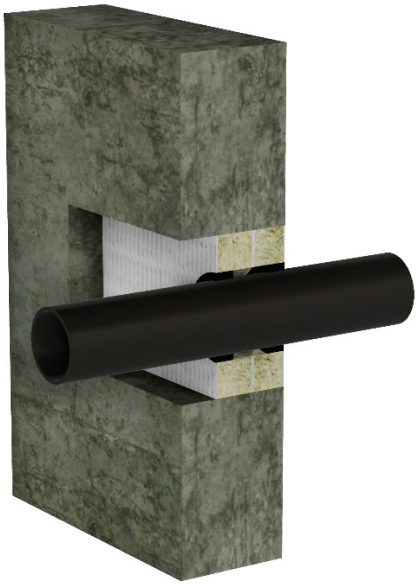
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Plastic pipe diameter ≤ (Ø) 90 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Plastic pipe type PE/PP/PVC ≤ Ø 90 mm, pipe wall thickness (t): 3.0 – 8.2 mm. U/C + C/C.				
Plastic pipe type PE/PP/PVC ≤ Ø 90 mm in wall. In combination with FIRESAFE GPG MORTAR. Max. opening in wall: 200 x 1000 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 3**
Plastic pipe type PE/PP/PVC ≤ Ø 90 mm in wall. In combination with FIRESAFE FT Board. Max. opening in wall: 200 x 1000 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 4**

Figure 3
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe in the GPG sealant. GPG MORTAR thickness 100 mm.

Figure 4
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe in FT Board. FIRESAFE FT Board 2S thickness 2 x 50 mm.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Plastic pipe diameter ≤ (Ø) 110 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Plastic pipe type PP-R, Green and Blue Power ≤ Ø 110 mm, pipe wall thickness (t): 3.7 – 15.1 mm. U/C + C/C.				
Pipe type PP-R, Green and Blue Power ≤ Ø 40 mm in wall. Pipe wall thickness (t): 3.7 - 5.5 mm. Max. opening in wall: Ø 60 mm.	10 x 40 mm	With or without backing	**EI 120**	**Figure 5**
Pipe type PP-R, Green and Blue Power ≤ Ø 40 mm in floor. Pipe wall thickness (t): 3.7 - 5.5 mm. Max. opening in floor: Ø 70 mm.	15 x 40 mm	With or without backing	**EI 240**	**Figure 6**
Pipe type PP-R, Green and Blue Power ≤ Ø 63 mm in wall. Pipe wall thickness (t): 5.8 - 8.6 mm. Max. opening in wall: Ø 83 mm.	10 x 40 mm	With or without backing	**EI 120**	**Figure 5**
Pipe type PP-R, Green and Blue Power ≤ Ø 63 mm in floor. Pipe wall thickness (t): 5.8 - 8.6 mm. Max. opening in floor: Ø 93 mm.	15 x 40 mm	With or without backing	**EI 180**	**Figure 6**
Pipe type PP-R, Green and Blue Power ≤ Ø 75 mm in wall. pipe wall thickness (t): 6.8 - 10.3 mm. Max. opening in wall: Ø 95 mm.	10 x 40 mm	With or without backing	**EI 120**	**Figure 5**
Pipe type PP-R, Green and Blue Power ≤ Ø 75 mm in floor. Pipe wall thickness (t): 6.8 - 10.3 mm. Max. opening in floor: Ø 105 mm.	15 x 40 mm	With or without backing	**EI 180**	**Figure 6**
Pipe type PP-R, Green and Blue Power ≤ Ø 110 mm in wall. Pipe wall thickness (t): 10.0 - 15.1 mm. Max. opening in wall: Ø 130 mm.	10 x 40 mm	With or without backing	**EI 60**	**Figure 5**
Pipe type PP-R, Green and Blue Power ≤ Ø 110 mm in floor. Pipe wall thickness (t): 10.0 - 15.1 mm. Max. opening in floor: Ø 140 mm.	15 x 40 mm	With or without backing	**EI 90**	**Figure 6**

Figure 5
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 40 mm around the plastic pipe.

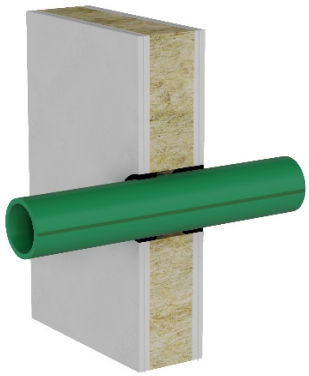


Figure 6
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 40 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall ≥ 150 mm				
Plastic pipe diameter ≤ (Ø) 110 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Plastic pipe type PP-R, Green and Blue Power ≤ Ø 110 mm, pipe wall thickness (t): 3.7 – 15.1 mm. U/C + C/C.				
Plastic pipe type PP-R, Green and Blue Power ≤ Ø 40 mm in wall. Pipe wall thickness (t): 3.7 - 5.5 mm. Max. opening in wall: Ø 70 mm.	15 x 40 mm	With or without backing	**EI 240**	**Figure 7**
Plastic pipe type PP-R, Green and Blue Power ≤ Ø 63 mm in wall. Pipe wall thickness (t): 5.8 - 8.6 mm. Max. opening in wall: Ø 93 mm.	15 x 40 mm	With or without backing	**EI 180**	**Figure 7**
Plastic pipe type PP-R, Green and Blue Power ≤ Ø 75 mm in wall. pipe wall thickness (t): 6.8 - 10.3 mm. Max. opening in wall: Ø 105 mm.	15 x 40 mm	With or without backing	**EI 180**	**Figure 7**
Plastic pipe type PP-R, Green and Blue Power ≤ Ø 110 mm in wall. Pipe wall thickness (t): 10.0 - 15.1 mm. Max. opening in wall: Ø 140 mm.	15 x 40 mm	With or without backing	**EI 60**	**Figure 7**

Figure 7

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 15 mm and a depth of 40 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Plastic pipe diameter ≤ (Ø) 110 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Plastic pipe type PP-MD ≤ Ø 110 mm, pipe wall thickness (t): 1.8 – 3.8 mm. U/C + C/C.				
Plastic pipe type PP-MD ≤ Ø 32 mm in wall. Pipe wall thickness (t): 1.8 mm. Max. opening in wall: Ø 52 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 8**
Plastic pipe type PP-MD ≤ Ø 32 mm in floor. Pipe wall thickness (t): 1.8 mm. Max. opening in floor: Ø 63 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 9**
Plastic pipe type PP-MD ≤ Ø 50 mm in wall. Pipe wall thickness (t): 2.0 mm. Max. opening in wall: Ø 70 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 8**
Plastic pipe type PP-MD ≤ Ø 50 mm in floor. Pipe wall thickness (t): 2.0 mm. Max. opening in floor: Ø 80 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 9**
Plastic pipe type PP-MD ≤ Ø 75 mm in wall. Pipe wall thickness (t): 2.6 mm. Max. opening in wall: Ø 95 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 8**
Plastic pipe type PP-MD ≤ Ø 75 mm in floor. Pipe wall thickness (t): 2.6 mm. Max. opening in floor: Ø 105 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 9**
Plastic pipe type PP-MD ≤ Ø 110 mm in wall. Pipe wall thickness (t): 3.8 mm. Max. opening in wall: Ø 130 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 8**
Plastic pipe type PP-MD ≤ Ø 110 mm in floor. Pipe wall thickness (t): 3.8 mm. Max. opening in floor: Ø 140 mm.	15 x 25 mm	With or without backing	**EI 60**	**Figure 9**

Figure 8
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

Figure 9
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall ≥ 150 mm				
Plastic pipe diameter ≤ (Ø) 75 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Plastic pipe type PP-MD ≤ Ø 75 mm, pipe wall thickness (t): 1.8 – 2.6 mm. U/C + C/C.				
Plastic pipe type PP-MD ≤ Ø 32 mm in wall. Pipe wall thickness (t): 1.8 mm. Max. opening in wall: Ø 62 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 10**
Plastic pipe type PP-MD ≤ Ø 50 mm in wall. Pipe wall thickness (t): 2.0 mm. Max. opening in wall: Ø 80 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 10**
Plastic pipe type PP-MD ≤ Ø 75 mm in wall. Pipe wall thickness (t): 2.6 mm. Max. opening in wall: Ø 105 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 10**

Figure 10

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open/Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Plastic pipe diameter ≤ (Ø) 110 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Plastic pipe type PP-MX ≤ Ø 110 mm, pipe wall thickness (t): 2.7 – 4.2 mm. U/C + C/C.				
Plastic pipe type PP-MX ≥ Ø 50 mm in wall. Pipe wall thickness (t): 2.7 mm. Incl. sleeve. Max. opening in wall: Ø 70 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 11**
Plastic pipe type PP-MX ≥ Ø 50 mm in floor. Pipe wall thickness (t): 2.7 mm. Incl. sleeve. Max. opening in floor: Ø 76 mm.	10 x 25 mm	With or without backing	**EI 240**	**Figure 12**
Plastic pipe type PP-MX ≤ Ø 110 mm in wall. Pipe wall thickness (t): 2.0 mm. Incl. sleeve. Max. opening in wall: Ø 130 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 11**
Plastic pipe type PP-MX ≤ Ø 110 mm in floor. Pipe wall thickness (t): 4.2 mm. Incl. sleeve. Max. opening in floor: Ø 142 mm.	10 x 25 mm	With or without backing	**EI 240**	**Figure 12**

Figure 11
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

Figure 12
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open/Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall ≥ 150 mm				
Plastic pipe diameter ≤ (Ø) 110 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Plastic pipe type PP-MX ≤ Ø 110 mm, pipe wall thickness (t): 2.6 – 2.7 mm. U/C + C/C.				
Plastic pipe type PP-MX ≥ Ø 50 mm in wall. Pipe wall thickness (t): 2.7 mm. Incl. sleeve. Max. opening in wall: Ø 71 mm.	10 x 25 mm	With or without backing	**EI 240**	**Figure 13**
Plastic pipe type PP-MX ≤ Ø 110 mm in wall. Pipe wall thickness (t): 4.2 mm. Incl. sleeve. Max. opening in wall: Ø 130 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 13**

Figure 13

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Plastic pipe diameter (Ø) 54 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Pipe in plastic pipe type P-EX (d) Inner diameter of pipe Ø 32mm – Outer diameter of pipe Ø 54 mm, pipe wall thickness (t): 4.4 mm. U/C + C/C.				
Pipe in pipe type P-EX Ø 54 mm in wall. Max. opening in wall: Ø 74 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 14**
Pipe in plastic pipe type P-EX Ø 54 mm in floor. Max. opening in floor: Ø 84 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 15**

Figure 14
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

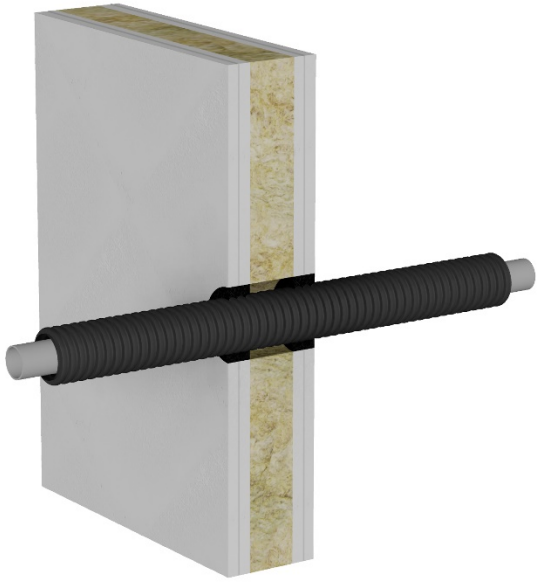


Figure 15
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Plastic pipe diameter (Ø) 25 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Pipe in plastic pipe type P-EX (d) Inner diameter of pipe Ø 16mm – Outer diameter of pipe Ø 25 mm, pipe wall thickness (t): 2.2 mm. U/C + C/C.				
Pipe in pipe type P-EX Ø 25 mm in wall. Pipe insulated with polyolefin*, thickness 10 mm. Max. opening in wall: Ø 65 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 16**
Pipe in plastic pipe type P-EX Ø 25 mm in floor. Pipe insulated with polyolefin*, thickness 10 mm. Max. opening in floor: Ø 65 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 17**

Figure 16
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

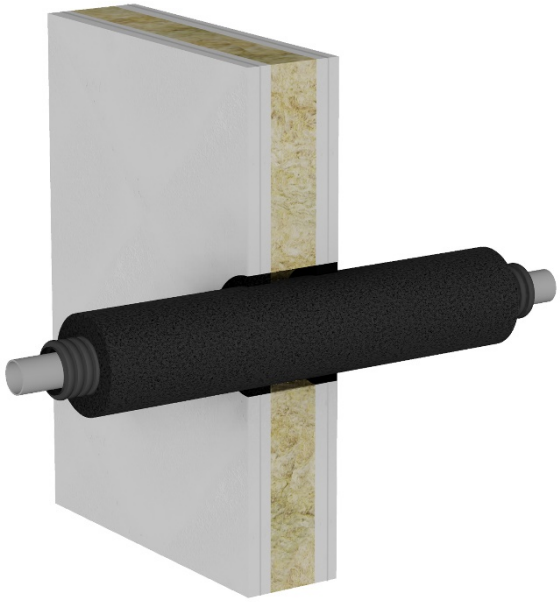


Figure 17
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

* Pipe insulated with 10 mm polyolefin, example Uponor density 28kg/m3.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation with minimum insulation length of 1200 mm, including through the penetration itself. Or continuously for the entire length of the pipe.

CI: Specified insulation interrupted in the penetration and insulation length extending out a minimum of 600 mm on both sides of a wall or floor.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Plastic pipe diameter (Ø) 54 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Pipe in plastic pipe type P-EX (d) Inner diameter of pipe Ø 32mm – Outer diameter of pipe Ø 54 mm, pipe wall thickness (t): 4.4 mm. U/C + C/C.				
Pipe in pipe type P-EX Ø 54 mm in wall. Pipe insulated with polyolefin*, thickness 20 mm. Max. opening in wall: Ø 114 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 18**
Pipe in plastic pipe type P-EX Ø 54 mm in floor. Pipe insulated with polyolefin*, thickness 20 mm. Max. opening in floor: Ø 124 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 19**

Figure 18
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

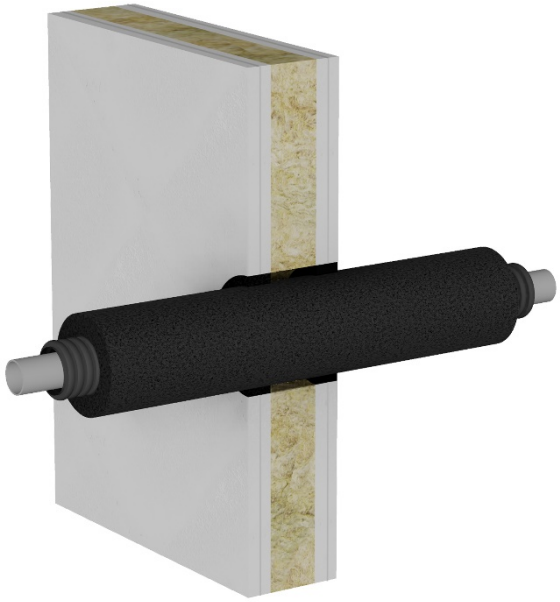


Figure 19
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the plastic pipe.

Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

* Pipe insulated with 20 mm polyolefin, example Uponor density 28kg/m3.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation with minimum insulation length of 1200 mm, including through the penetration itself. Or continuously for the entire length of the pipe.

CI: Specified insulation interrupted in the penetration and insulation length extending out a minimum of 600 mm on both sides of a wall or floor.

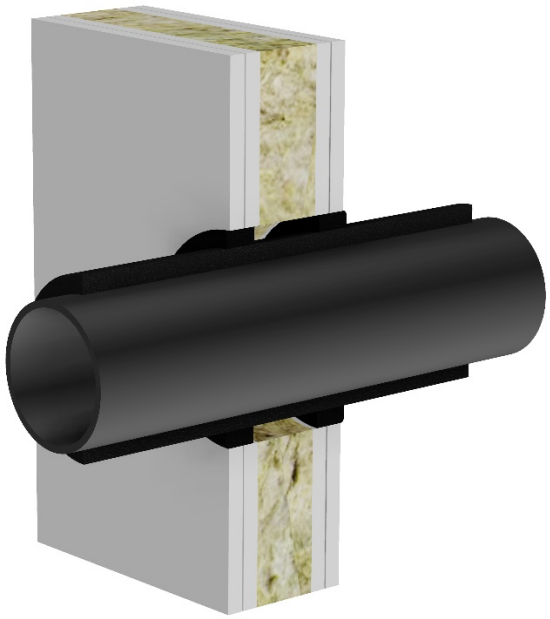
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Plastic pipe diameter ≤ (Ø) 110 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Insulated plastic pipe type PE ≤ Ø 110 mm in wall. Pipe wall thickness (t): ≥ 4.2 mm. U/C.				
Plastic pipe type PE ≤ Ø 110 mm in wall. Pipe is insulated with synthetic rubber*, thickness 13mm. Max. opening in wall Ø 156 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 20**

Figure 20

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

*Pipe insulated with 13 mm synthetic rubber Armaflex, or equivalent synthetic rubber in fire rating Euroclass B/ BL, s3-d0.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

LI: Specified insulation locally with specified length of 350 mm out from wall on both sides,but interrupted in the penetration itself.

CS: Specified insulation continuous through the entire length of the pipe, including in the penetration itself. CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm.				
Bundled penetration ≤ (Ø) 121 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Pipe in plastic pipe type P-EX (d) Outer diameter of pipe Ø 28mm, pipe wall thickness (t): 2.5 mm. U/C + C/C.				
Pipe in pipe type P-EX Ø 28 mm in wall. Pipe insulated with polyolefin*, thickness 10 mm. Electrical cable conduit ≤ Ø 28 mm. Max. opening in wall Ø 144 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 21**
Pipe in plastic pipe type P-EX Ø 32 mm in floor. Pipe insulated with polyolefin*, thickness 10 mm. Electrical cable conduit ≤ Ø 28 mm. Plastic pipe type PP ≤ Ø 110 mm cast in floor. Max. opening in floor Ø 110 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 22**

Figure 21
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around pipes in bundle.

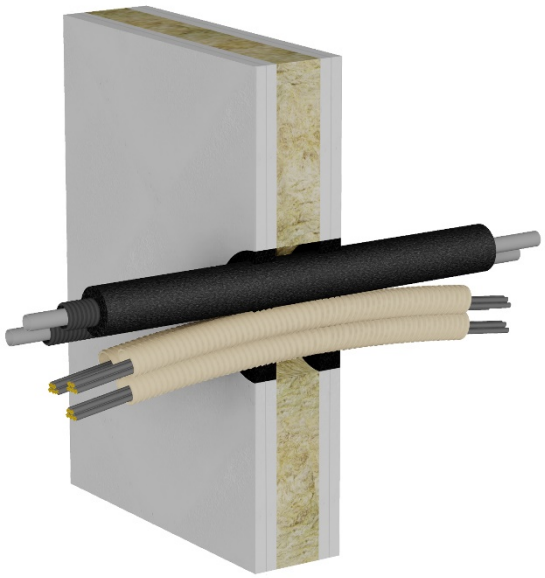
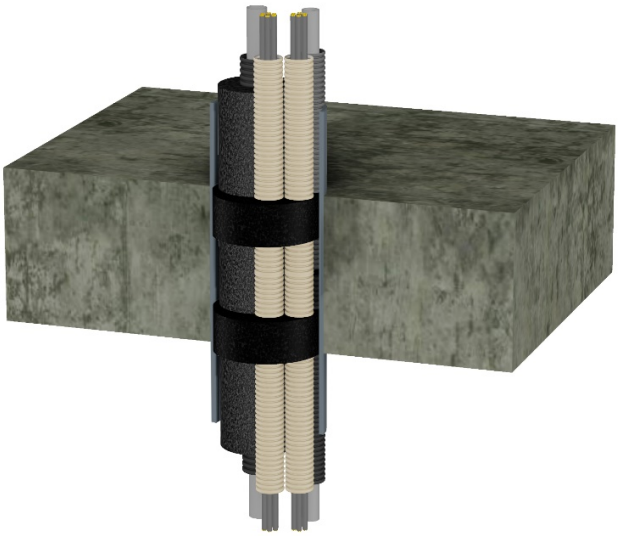


Figure 22
Apply the sealant to interior of plastic pipe bundle level with upper edge and lower edge of floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around pipes in bundle.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

* Pipe insulated with 10 mm polyolefin, example Uponor density 28/kg/m3.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible shaft wall ≥ 75 mm.				
Bundled penetration ≤ (Ø) 121 mm	**Width × depth FT Graphite from one side (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Pipe in plastic pipe type P-EX (d) Inner diameter of pipe Ø 15mm – Outer diameter of pipe Ø 28 mm, pipe wall thickness (t): 2.5 mm. U/C + C/C.				
Pipe in pipe PE-X Ø 28 mm in shaft wall. Pipe insulated with polyolefin*, thickness 10 mm. + Electrical cable conduit Ø 32 mm. Max. opening in shaft wall Ø 144 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 23**
2 pipes in pipe PE-X ≤ Ø 28 mm in shaft wall. Pipe insulated with polyolefin*, thickness 10 mm. 2 pcs electrical cable conduit Ø 32 mm. Shaft wall with FIRESAFE FT Board 2 S applied on one side, thickness 50 mm. Max. opening in shaft wall 300 x 1200 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 24**

Figure 23
Apply the sealant around the pipe on one side of the shaft wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the plastic pipe.

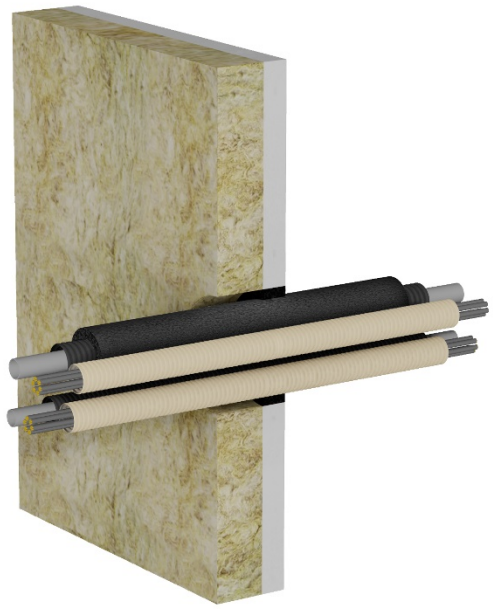
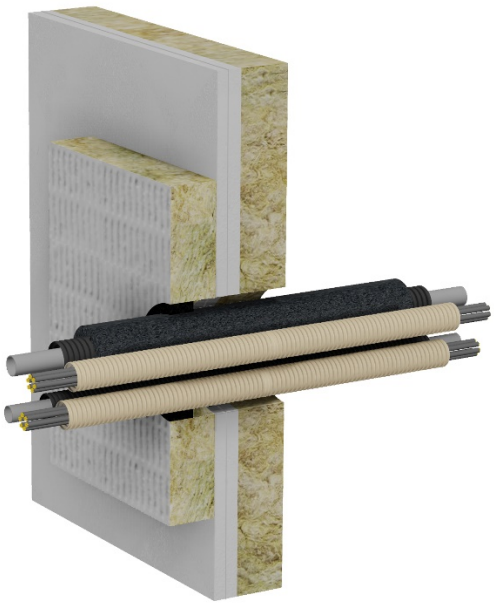


Figure 24
Apply the sealant around the pipe on one side of the shaft wall, level with FT Board. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the plastic pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

* Pipe insulated with 10 mm polyolefin, example Uponor density 28kg/m3.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

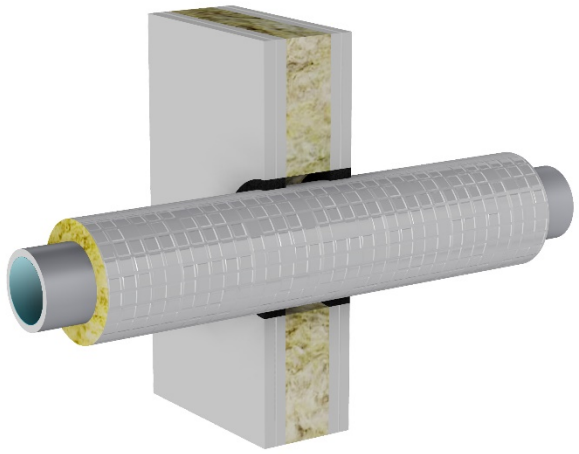
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Aluminium pipe diameter (Ø) 16 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Aluminium pipe type aluPE-X, (d): Ø 16 mm, pipe thickness (t): 2.0 mm. U/C + C/C.				
Pipe in wall insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall: Ø 76 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 25**
Pipe in wall insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall: Ø 96 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 25**
Pipe in wall insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall: Ø 116 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 25**
Pipe in wall insulated with glass wool or stone wool*, thickness: 50mm. Max. opening in wall: Ø 136 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 25**
Pipe in wall insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall: Ø 156 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 25**
Pipe in wall insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall: Ø 196 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 25**

Figure 25

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0. Or pipe insulation of Stone wool with same density, thickness and fire resistance class.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

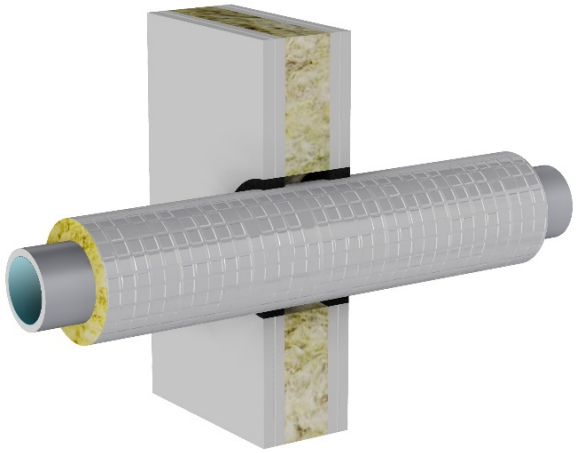
CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Aluminium pipe diameter ≤ (Ø) 75 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Aluminium pipe type aluP-EX, (d): ≤ Ø 75 mm, pipe wall thickness (t): 7.5 mm. U/C + C/C.				
Pipe in wall insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall: Ø 135 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 26**
Pipe in wall insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall: Ø 155 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 26**
Pipe in wall insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall: Ø 175 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 26**
Pipe in wall insulated with glass wool or stone wool*, thickness: 50mm. Max. opening in wall: Ø 195 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 26**
Pipe in wall insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall: Ø 215 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 26**
Pipe in wall insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall: Ø 255 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 26**

Figure 26
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0. Or pipe insulation of Stone wool with same density, thickness and fire resistance class.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

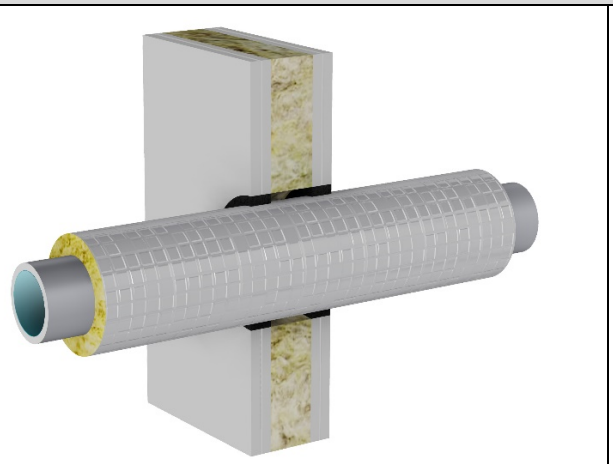
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall and rigid floor ≥ 150 mm.				
Aluminium pipe diameter (Ø) 16 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Aluminium pipe type aluP-EX, (d): Ø 16 mm, pipe thickness (t): 2.0 mm. U/C + C/C.				
Pipe insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall / floor: Ø 86 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 27**
Pipe insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall / floor: Ø 106 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 27**
Pipe insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall / floor: Ø 126 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 27**
Pipe insulated with glass wool or stone wool*, thickness: 50mm. Max. opening in wall / floor: Ø 146 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 27**
Pipe insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall / floor: Ø 166 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 27**
Pipe insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall / floor: Ø 206 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 27**

Figure 27

Apply the sealant around the pipe on both sides of the wall / floor. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0. Or pipe insulation of Stone wool with same density, thickness and fire resistance class.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

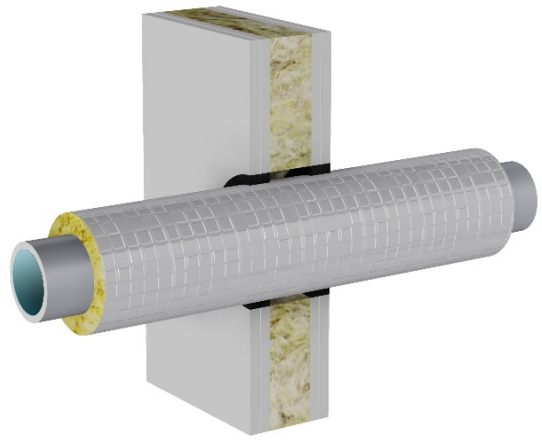
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall and rigid floor ≥ 150 mm.				
Aluminium pipe diameter ≤ (Ø) 75 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Aluminium pipe type aluP-EX, (d): Ø 75 mm, pipe thickness (t): 7.5 mm. U/C + C/C.				
Pipe insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall / floor: Ø 145 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 28**
Pipe insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall / floor: Ø 165 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 28**
Pipe insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall / floor: Ø 185 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 28**
Pipe insulated with glass wool or stone wool*, thickness: 50mm. Max. opening in wall / floor: Ø 205 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 28**
Pipe insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall / floor: Ø 225 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 28**
Pipe insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall / floor: Ø 265 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 28**

Figure 28

Apply the sealant around the pipe on both sides of the wall / floor. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0. Or pipe insulation of Stone wool with same density, thickness and fire resistance class.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

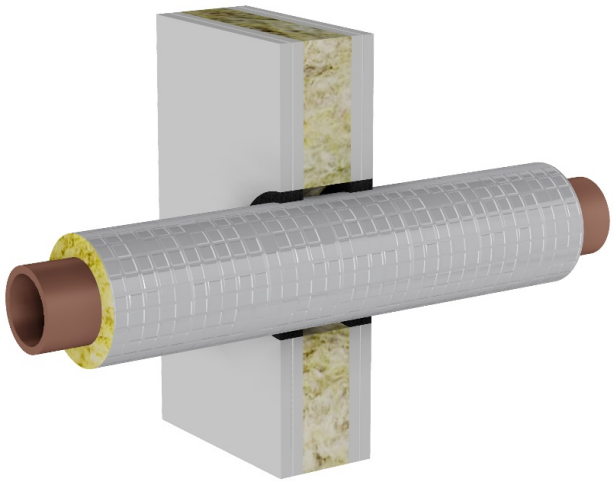
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Copper and steel pipe diameter (Ø) 15 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Copper and steel pipe (d): Ø 15 mm, pipe thickness (t): 1.0 mm. C/U + C/C.				
Pipe in wall insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall: Ø 75 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 29**
Pipe in wall insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall: Ø 95 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 29**
Pipe in wall insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall: Ø 115 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 29**
Pipe in wall insulated with glass wool or stone wool*, thickness: 50 mm. Max. opening in wall: Ø 135 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 29**

Figure 29

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

C/U: Capped /Uncapped. Closed /Open, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0. Or pipe insulation of Stone wool with same density, thickness and fire resistance class.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

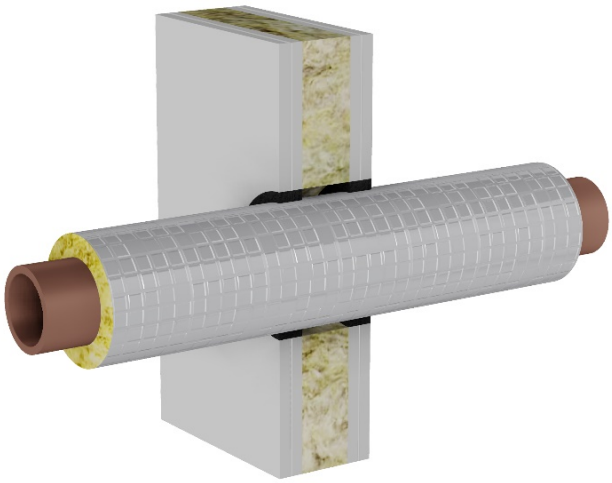
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Copper and steel pipe diameter ≤ (Ø) 76 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Copper and steel pipe (d): ≤ (Ø) 76 mm, pipe wall thickness (t): 2.1 mm. C/U + C/C.				
Pipe in wall insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall: Ø 136 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 30**
Pipe in wall insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall: Ø 156 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 30**
Pipe in wall insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall: Ø 176 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 30**
Pipe in wall insulated with fibre glass wool or stone wool*, thickness: 50mm. Max. opening in wall: Ø 196 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 30**
Pipe in wall insulated with glass wool or stone wool*, thickness: 60mm. Max. opening in wall: Ø 216 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 30**
Pipe in wall insulated with glass wool or stone wool*, thickness: 80mm. Max. opening in wall: Ø 256 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 30**

Figure 30

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 °in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

C/U: Capped /Uncapped. Closed /Open, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type fibre glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0.

Or pipe insulation of stone wool with same density, thickness and fire rating.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

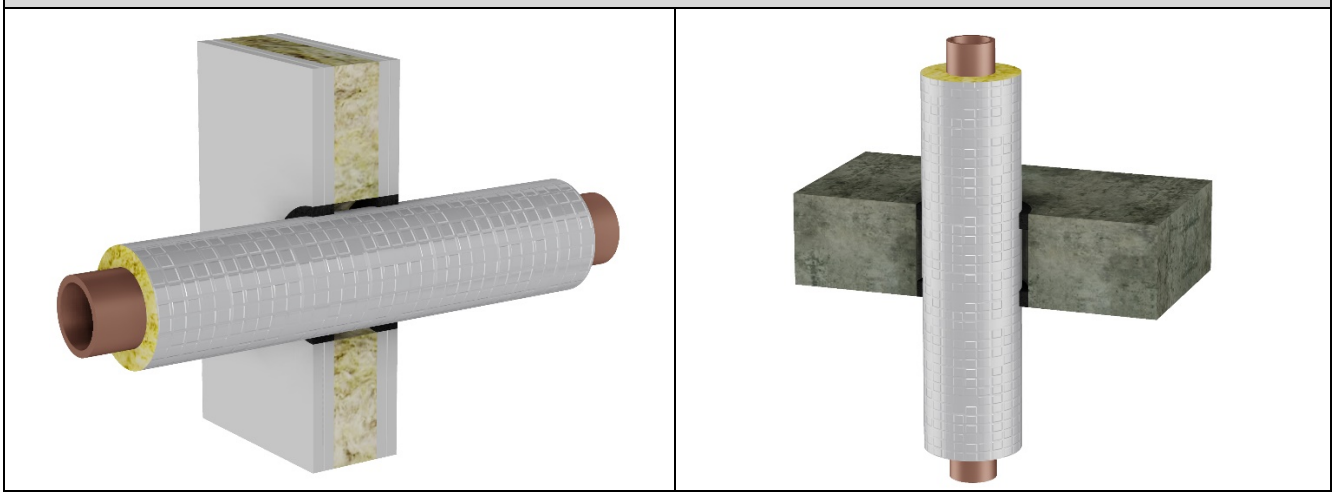
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall and rigid floor ≥ 150 mm.				
Copper and steel pipe diameter ≤ (Ø) 15 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Copper and steel pipe (d): Ø 15 mm, pipe thickness (t): 1.0 mm. C/U + C/C.				
Pipe insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall / floor: Ø 85 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 31**
Pipe insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall / floor: Ø 105 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 31**
Pipe insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall / floor: Ø 125 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 31**
Pipe insulated with glass wool or stone wool*, thickness: 50mm. Max. opening in wall / floor: Ø 145 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 31**
Pipe insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall / floor: Ø 165 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 31**
Pipe insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall / floor: Ø 205 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 31**

Figure 31

Apply the sealant around the pipe on both sides of the wall / floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 °in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

C/U: Capped/ Uncapped. Closed /Open, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type fibre glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0.

Or pipe insulation of stone wool with same density, thickness and fire rating.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

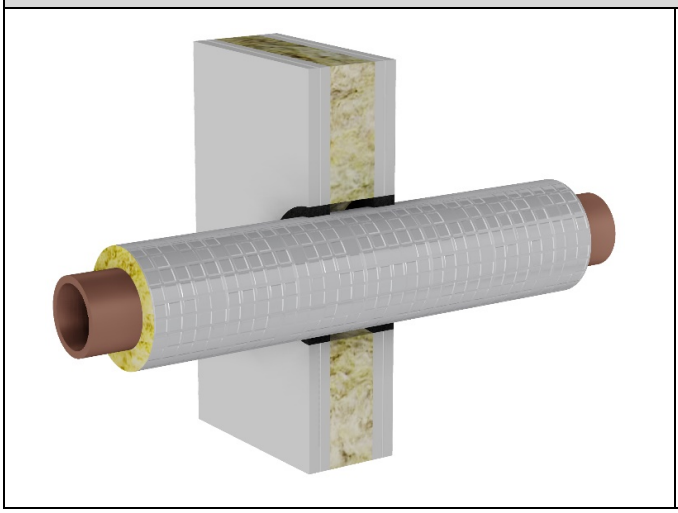
CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

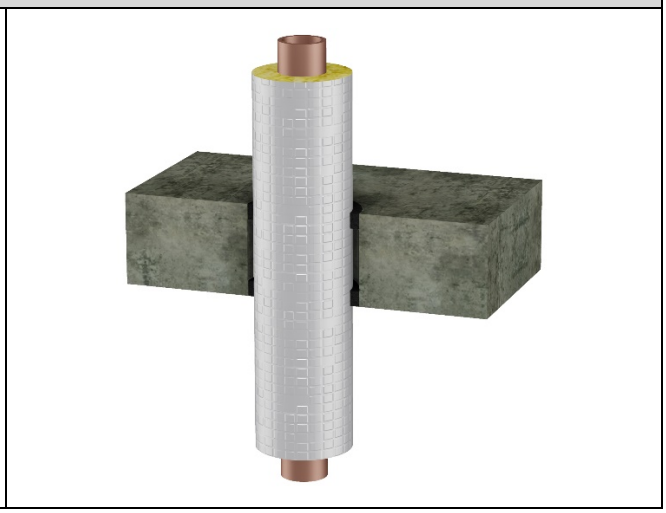
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall and rigid floor ≥ 150 mm.				
Copper and steel pipe diameter ≤ (Ø) 76 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Copper and steel pipe (d): ≤ (Ø) 76 mm, pipe wall thickness (t): 2.1 mm. C/U + C/C.				
Pipe insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall / floor: Ø 150 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 32**
Pipe insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall / floor: Ø 166 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 32**
Pipe insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall / floor: Ø 186 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 32**
Pipe insulated with glass wool or stone wool*, thickness: 50 mm. Max. opening in wall / floor: Ø 206 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 32**
Pipe insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall / floor: Ø 226 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 32**
Pipe insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall / floor: Ø 266 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 32**

Figure 32
Apply the sealant around the pipe on both sides of the wall / floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.





Pipes can be at any angle between 90 ° and 45 °in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

C/U: Capped/ Uncapped. Closed /Open, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type fibre glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0.

Or pipe insulation of stone wool with same density, thickness and fire rating.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

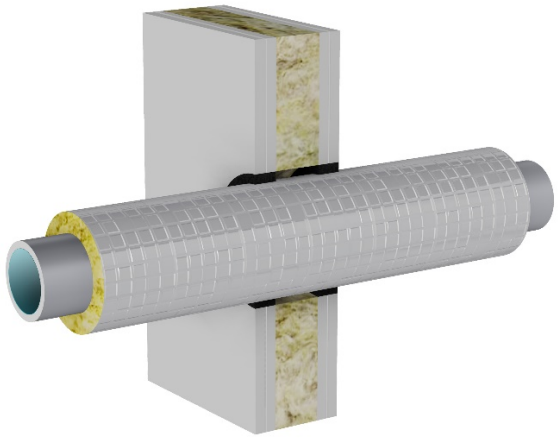
CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Steel pipe diameter ≤ (Ø) 42.2 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d): ≤ (Ø) 42.2 mm, pipe wall thickness (t): 3.25 mm. U/C + C/C.				
Pipe in wall insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall: Ø 102 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 33**
Pipe in wall insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall: Ø 122 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 33**
Pipe in wall insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall: Ø 142 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 33**
Pipe in wall insulated with glass wool or stone wool*, thickness: 50 mm. Max. opening in wall: Ø 162 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 33**
Pipe in wall insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall: Ø 182 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 33**
Pipe in wall insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall: Ø 222 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 33**

Figure 33
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 °in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type fibre glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0.

Or pipe insulation of stone wool with same density, thickness and fire rating.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

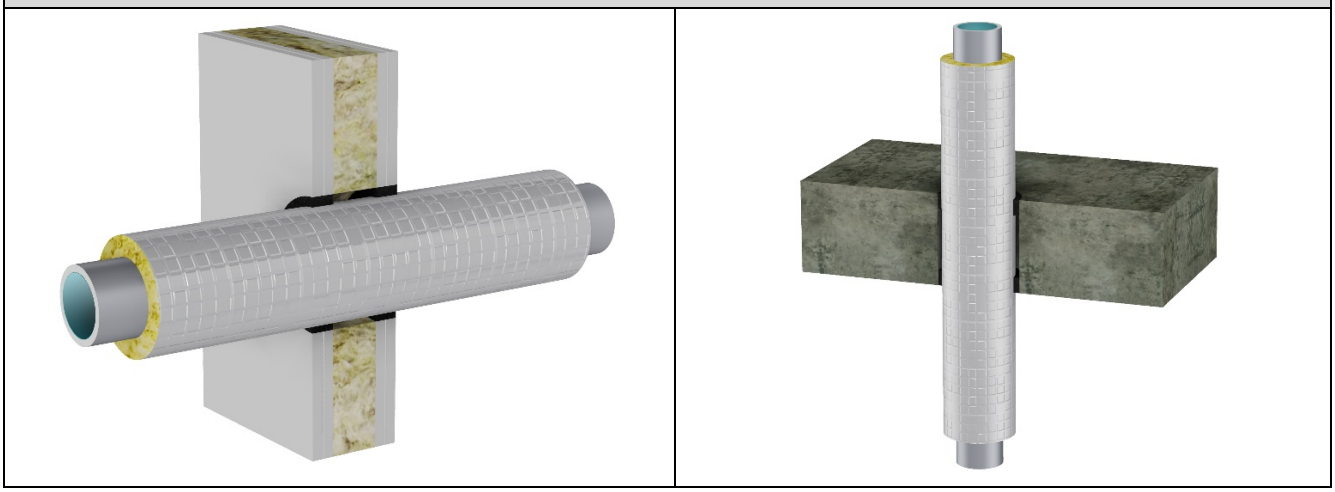
CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall and rigid floor ≥ 150 mm.				
Steel pipe diameter ≤ (Ø) 42.2 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d): ≤ Ø 42.2 mm, Pipe wall thickness (t): 3.25 mm. U/C + C/C.				
Pipe insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall / floor: Ø 112 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 34**
Pipe insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall / floor: Ø 132 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 34**
Pipe insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall / floor: Ø 152 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 34**
Pipe insulated with glass wool or stone wool*, thickness: 50 mm. Max. opening in wall / floor: Ø 172 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 34**
Pipe insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall / floor: Ø 192 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 34**
Pipe insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall / floor: Ø 244 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 34**

Figure 34
Apply the sealant around the pipe on both sides of the wall / floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 °in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type fibre glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0.

Or pipe insulation of stone wool with same density, thickness and fire rating.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

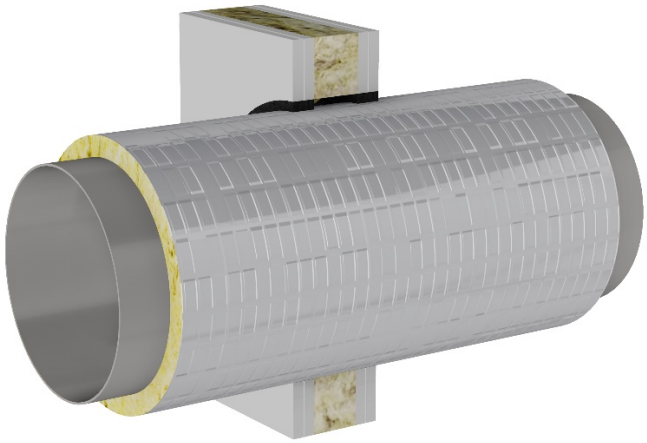
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible wall and rigid wall ≥ 100 mm.				
Steel pipe diameter ≤ (Ø) 219.1 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d): ≤ (Ø) 219.1 mm, pipe thickness (t): 4.5 mm. U/C + C/C.				
Pipe in wall insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in wall: Ø 279 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 35**
Pipe in wall insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in wall: Ø 299 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 35**
Pipe in wall insulated with glass wool or stone wool*, thickness: 40 mm. Max. opening in wall: Ø 319 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 35**
Pipe in wall insulated with glass wool or stone wool*, thickness: 50 mm. Max. opening in wall: Ø 339 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 35**
Pipe in wall insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in wall: Ø 359 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 35**
Pipe in wall insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in wall: Ø 399 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 35**

Figure 35

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 °in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type fibre glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0.

Or pipe insulation of stone wool with same density, thickness and fire rating.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid floor ≥ 150 mm.				
Steel pipe diameter ≤ (Ø) 219.1 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d): ≤ (Ø) 219.1 mm, pipe thickness (t): 4.5 mm. U/C + C/C.				
Pipe in floor insulated with glass wool or stone wool*, thickness: 20 mm. Max. opening in floor: Ø 289 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 36**
Pipe in floor insulated with glass wool or stone wool*, thickness: 30 mm. Max. opening in floor: Ø 309 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 36**
Pipe in floor insulated with fibre glass wool or stone wool*, thickness: 40 mm. Max. opening in floor: Ø 329 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 36**
Pipe in floor insulated with glass wool or stone wool*, thickness: 50 mm. Max. opening in floor: Ø 349 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 36**
Pipe in floor insulated with glass wool or stone wool*, thickness: 60 mm. Max. opening in floor: Ø 369 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 36**
Pipe in floor insulated with glass wool or stone wool*, thickness: 80 mm. Max. opening in floor: Ø 409 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 36**

Figure 36
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.

Pipes can be at any angle between 90 ° and 45 °in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type fibre glass wool ISOVER ClimPipe Section Alu2 with density 75 kg/m3. Fire resistance class $A2_L$-s1, d0.

Or pipe insulation of stone wool with same density, thickness and fire rating.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1200 mm, including in the penetration itself.

CI: Specified insulation continuous through the entire length of the pipe, but interrupted in the penetration itself, minimum 600 mm on each side of the penetration.

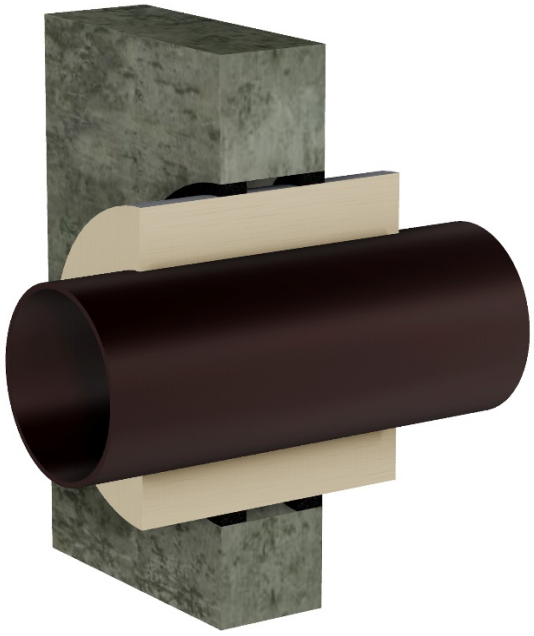
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Steel pipe diameter ≥ (Ø) 42.2 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d): ≥ (Ø) 42.2 mm, Pipe wall thickness (t): 3.25 mm. U/C + C/C.				
Pipe in wall insulated with PIR*, thickness: 25 mm. Max. opening in wall: Ø 112 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 37**
Pipe in wall insulated with PIR*, thickness: 50 mm. Max. opening in wall: Ø 162 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 37**

Figure 37

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type thermoplastic PIR with density 33 kg/m3.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1000 mm, including in the penetration itself.

LI: Specified insulation locally with specified length from wall on both sides, but interrupted in the penetration itself, insulation length 500 mm out on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid wall and rigid floor ≥ 150 mm.				
Steel pipe diameter ≥ (Ø) 42.2 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d): ≥ (Ø) 42.2 mm, Pipe wall thickness (t): 3.25 mm. U/C + C/C.				
Pipe insulated with PIR*, thickness: 25 mm. Max. opening in wall / floor: Ø 122 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 38**
Pipe insulated with PIR*, thickness: 50 mm. Max. opening in wall / floor: Ø 172 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 39**

Figure 38
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.

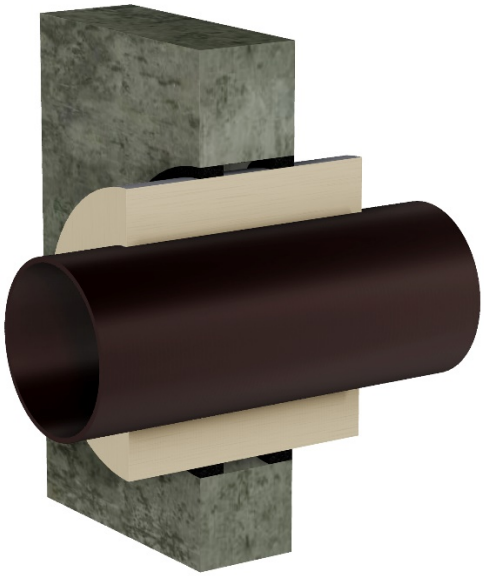
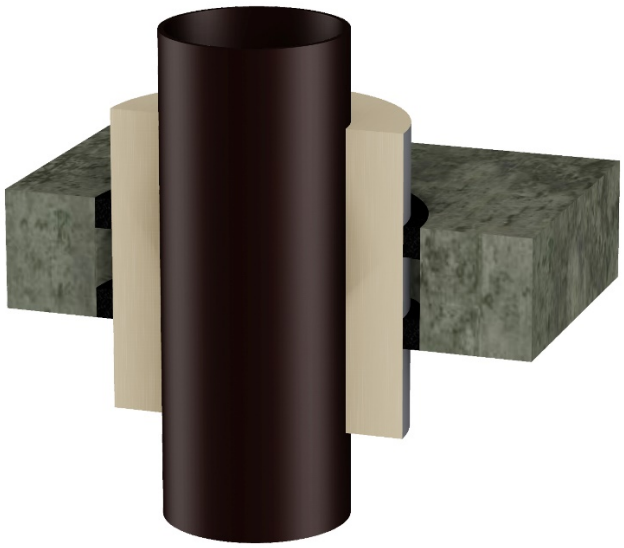


Figure 39
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type thermoplastic PIR with density 33 kg/m3.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1000 mm, including in the penetration itself.

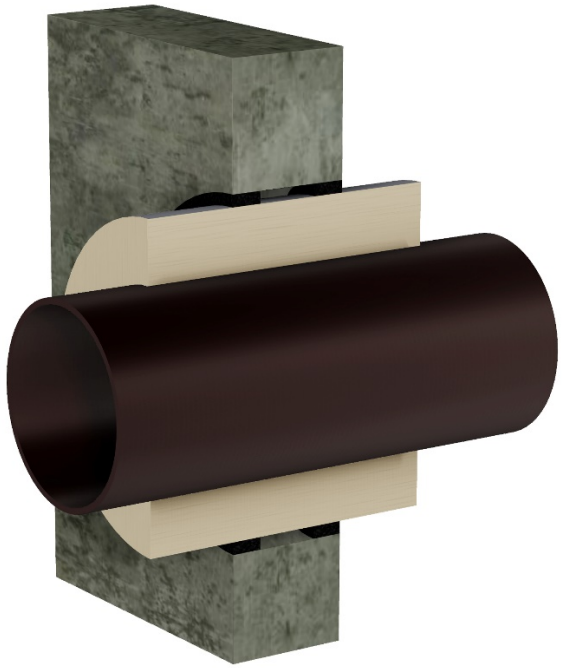
LI: Specified insulation locally with specified length from wall on both sides, but interrupted in the penetration itself, insulation length 500 mm out on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Steel pipe diameter ≤ (Ø) 219.1 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d): ≤ (Ø) 219.1 mm, pipe thickness (t): 4.5 mm. U/C + C/C.				
Pipe in wall insulated with PIR*, thickness: 25 mm. Max. opening in wall: Ø 289 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 40**
Pipe in wall insulated with PIR*, thickness: 50 mm. Max. opening in wall: Ø 339 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 40**

Figure 40
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulation type thermoplastic PIR with density 33 kg/m3.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1000 mm, including in the penetration itself.

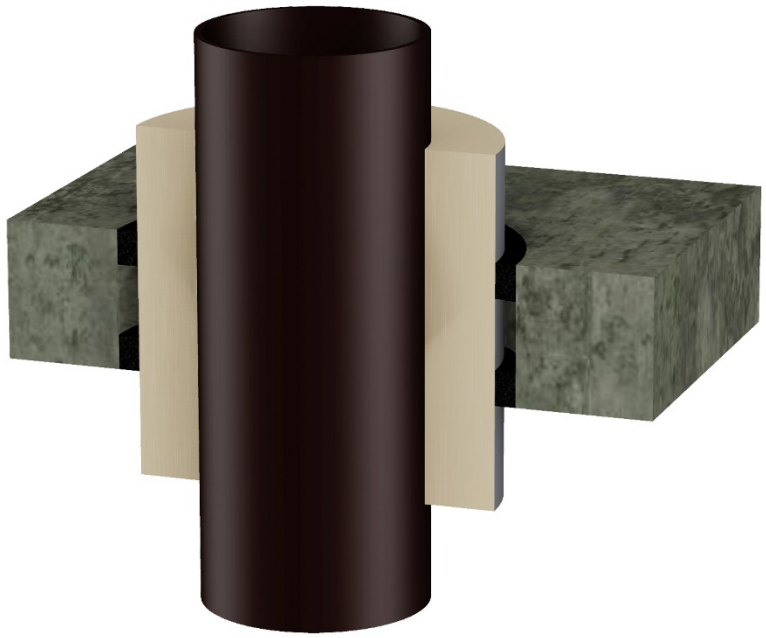
LI: Specified insulation locally with specified length from wall on both sides, but interrupted in the penetration itself, insulation length 500 mm out on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Rigid floor ≥ 150 mm.				
Steel pipe diameter ≤ (Ø) 219.1 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d): ≤ (Ø) 219.1 mm, pipe thickness (t): 4.5 mm. U/C + C/C.				
Pipe in floor insulated with PIR*, thickness: 25 mm. Max. opening in floor: Ø 299 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 41**
Pipe in floor insulated with PIR*, thickness: 50 mm. Max. opening in floor: Ø 349 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 41**

Figure 41
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Forklaring på forkortelser ved røravslutning i test (ref. NS-EN 1366-3: 2009, Tabell 2):

*Pipe insulation type thermoplastic PIR with density 33 kg/m3.

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

CS: Specified insulation continuous through the entire length of the pipe or passing through a minimum of 1000 mm, including in the penetration itself.

LI: Specified insulation locally with specified length from wall on both sides, but interrupted in the penetration itself, insulation length 500 mm out on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Aluminium pipe diameter ≤ (Ø) 75 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Aluminium pipe AluPEX, (d): ≤ (Ø) 75 mm, pipe thickness (t): 2.0 - 7.5 mm. U/C + C/C.				
Pipe in wall insulated with synthetic rubber *, thickness 13 mm. In combination with FIRESAFE GPG MORTAR. Max. opening in wall: 200 x 1000 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 42**
Pipe in floor insulated with synthetic rubber *, thickness 13 mm. In combination with FIRESAFE GPG MORTAR. Max. opening in floor: 200 x 1000 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 43**

Figure 42
FIRESAFE GPG MORTAR thickness 100 mm**.**
Apply FIRESAFE FT Graphite around the pipe on both sides of the wall level with the GPG sealant on both sides. Apply FIRESAFE FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.

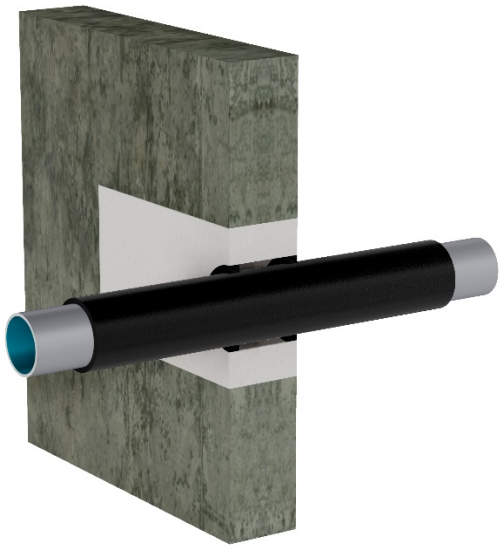
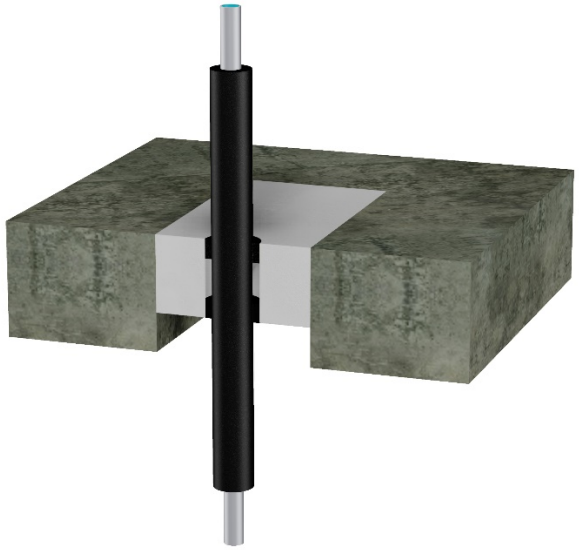


Figure 43
FIRESAFE GPG MORTAR thickness 100 mm**.**
Apply FIRESAFE FT Graphite around the pipe on both sides of the floor level with the GPG sealant on both sides. Apply FIRESAFE FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulated with 13 mm synthetic rubber, example type Armaflex, density 60kg/m3. Fire resistance class B/ B_L-s3-d0.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

LS: Specified insulation with minimum insulation length of 700 mm, including through the penetration itself.

LI: Specified insulation locally with specified length from wall on both sides, but interrupted in the penetration itself, insulation length 350 mm out on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Aluminium pipe diameter ≤ (Ø) 75 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Aluminium pipe AluPEX, (d): ≤ (Ø) 75 mm, pipe thickness (t): 2.0 - 7.5 mm. U/C + C/C.				
Pipe in wall insulated with synthetic rubber *, thickness 13 mm. In combination with FIRESAFE FT Board 2 S. Max. opening in wall: 600 x 1200 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 44**
Pipe in floor insulated with synthetic rubber *, thickness 13 mm. In combination with FIRESAFE FT Board 2 S. Max. opening in floor: 600 x 5000 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 45**

Figure 44
FIRESAFE FT Board thickness 2 x 50 mm.
Apply FIRESAFE FT Graphite around the pipe on both sides of the wall level with FT Board on both sides. Apply FIRESAFE FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.

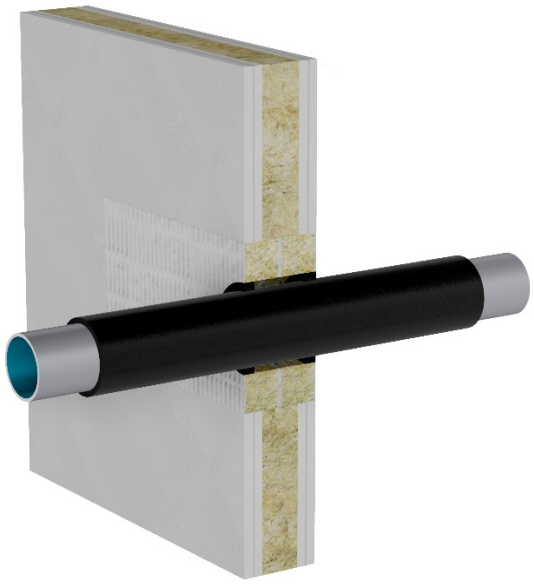
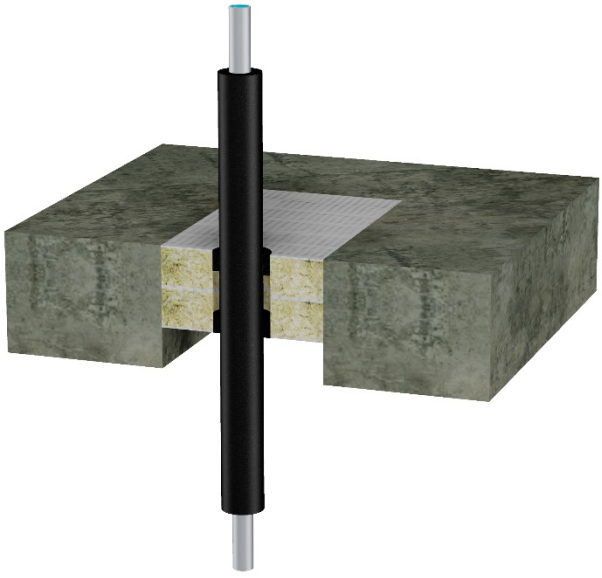


Figure 45
FIRESAFE FT BOARD thickness 2 x 50 mm.
Apply FIRESAFE FT Graphite around the pipe on both sides of the floor level with FT Board on both sides. Apply FIRESAFE FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulated with 13 mm synthetic rubber, example type Armaflex, density 60kg/m3. Fire resistance class B/ B_L-s3-d0.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

LS: Specified insulation with minimum insulation length of 700 mm, including through the penetration itself.

LI: Specified insulation locally with specified length from wall on both sides, but interrupted in the penetration itself, insulation length 350 mm out on each side of the penetration.

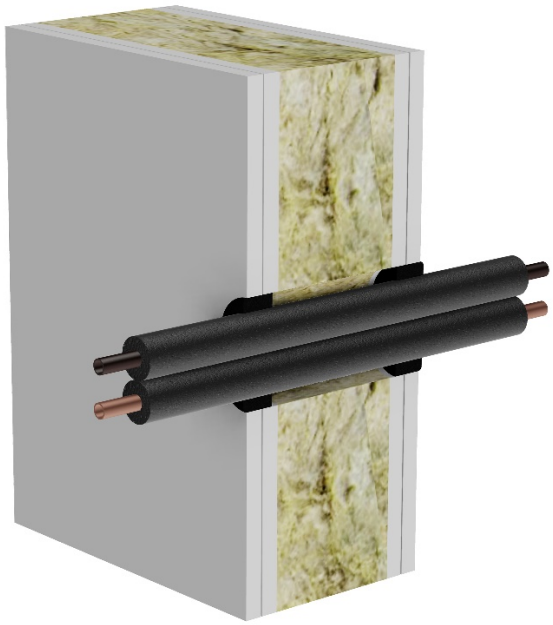
Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Copper and steel pipe diameter ≤ (Ø) 8 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Copper and steel pipe (d): ≤ (Ø) 8 mm, pipe thickness (t): 0.8 mm. U/C.				
2 pipes in wall insulated with neoprene foam*, thickness 9 mm. Max. opening in wall: Ø 72 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 46**

Figure 46

Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between 90 ° and 45 ° in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

* Pipe insulation type neoprene foam plastic thickness 9 mm.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

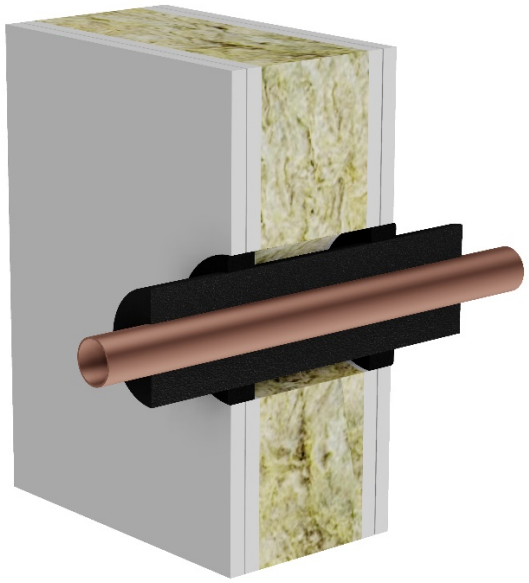
CS: Specified insulation continuous through the entire length of the pipe, including in the penetration itself.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm.				
Copper and steel pipe diameter ≤ (Ø) 35 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
copper and steel pipe (d) ≤ Ø 35 mm, pipe thickness (t): 1.5 mm. U/C + C/C.				
Pipe in wall insulated with synthetic rubber*, thickness: 13 mm. Max. opening in wall: Ø 81 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 47**
Pipe in wall insulated with synthetic rubber *, thickness: 25 mm. Max. opening in wall: Ø 105 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 47**

Figure 47
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.



Pipes can be at any angle between90 ° and 45 °in relation to wall or floor, providing the correct sealing thicknesses of FIRESAFE FT Graphite are used.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulated with 13 mm and 25 mm Armaflex density 60kg/m3, or equivalent synthetic rubber. Fire resistance class B/ B_L-s3-d0.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

LS: Specified insulation with minimum insulation length of 700 mm, including through the penetration itself.

CS: Specified insulation continuous through the entire length of the pipe, including in the penetration itself.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Steel pipe diameter (Ø) 15 - 42.2 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d) Ø 15 – 42.2 mm, pipe wall thickness (t): 1.0 – 3.25 mm. U/C + C/C.				
Pipe in wall Ø 15 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in wall: Ø 61 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 48**
Pipe in wall Ø 15 mm insulated with synthetic rubber*, thickness 25 mm. Max. opening in wall: Ø 85 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 48**
Pipe in wall Ø 22 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in wall: Ø 68 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 48**
Pipe in wall Ø 35 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in wall: Ø 81 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 48**
Pipe in wall Ø 35 mm insulated with synthetic rubber*, thickness 25 mm. Max. opening in wall: Ø 98 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 48**
Pipe in wall Ø 42.2 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in wall: Ø 89 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 48**
Pipe in wall Ø 42.2 mm insulated with synthetic rubber*, thickness 25 mm. Max. opening in wall: Ø 112 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 48**
Pipe in floor Ø 22 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in floor: Ø 68 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 49**
Pipe in floor Ø 42.2 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in floor: Ø 98 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 49**
Pipe in floor Ø 42.2 mm insulated with synthetic rubber*, thickness 25 mm. Max. opening in floor: Ø 122 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 49**

Figure 48
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.

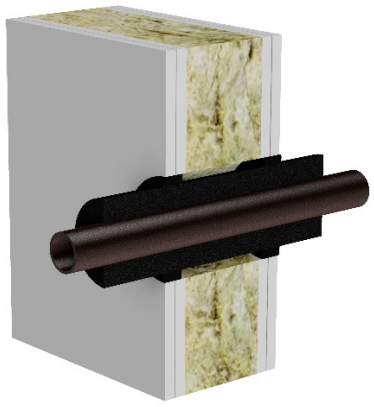


Figure 49
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):
U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.
C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.
*Pipe insulated with 13 mm and 25 mm type Armaflex density 60kg/m3, or equivalent synthetic rubber. Fire resistance class B/ B_L-s3-d0.
Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):
LS: Specified insulation with minimum insulation length of 700 mm, including through the penetration itself.
LI: Specified insulation locally with specified length from wall/ floor on both sides, but interrupted in the penetration itself, insulation length 350 mm out on each side of the penetration.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Steel pipe diameter (Ø) 42.2 – 219.1 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d) Ø 42.2 – 219.1 mm, pipe wall thickness (t): 3.25 – 14.2 mm. U/C + C/C.				
Pipe in wall Ø 42.2 mm insulated with synthetic rubber*, thickness 10 mm. Max. opening in wall: Ø 83 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 50**
Pipe in wall Ø 101.6 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in wall: Ø 148 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 50**
Pipe in wall Ø 219.1 mm insulated with synthetic rubber*, thickness 10 mm. Max. opening in wall: Ø 259 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 50**
Pipe in wall Ø 219.1 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in wall: Ø 265 mm.	10 x 25 mm	With or without backing	**EI 120**	**Figure 50**
Pipe in wall Ø 219.1 mm insulated with synthetic rubber*, thickness 25 mm. Max. opening in wall: Ø 289 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 50**
Pipe in floor Ø 42.2 mm insulated with synthetic rubber*, thickness 10 mm. Max. opening in floor: Ø 102 mm.	15 x 25 mm	With or without backing	**EI 240**	**Figure 51**
Pipe in floor Ø 42.2 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in floor: Ø 98 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 51**
Pipe in floor Ø 42.2 mm insulated with synthetic rubber*, thickness 25 mm. Max. opening in floor: Ø 122 mm.	15 x 25 mm	With or without backing	**EI 180**	**Figure 51**
Pipe in floor Ø 101.6 insulated with synthetic rubber*, thickness 13 mm. Max. opening in floor: Ø 148 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 51**
Pipe in floor Ø 219.1 mm insulated with synthetic rubber*, thickness 10 mm. Max. opening in floor: Ø 269 mm.	15 x 25 mm	With or without backing	**EI 90**	**Figure 51**
Pipe in floor Ø 219.1 mm insulated with synthetic rubber*, thickness 13 mm. Max. opening in floor: Ø 276 mm.	15 x 25 mm	With or without backing	**EI 60**	**Figure 51**
Pipe in floor Ø 219.1 mm insulated with synthetic rubber*, thickness 25 mm. Max. opening in floor: Ø 300 mm.	15 x 25 mm	With or without backing	**EI 60**	**Figure 51**

Figure 50
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around insulated pipe.

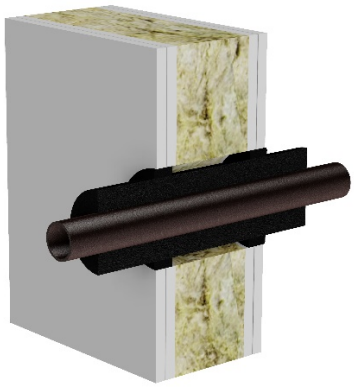


Figure 51
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.

Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

*Pipe insulated with 10, 13- or 25-mm synthetic rubber type Armaflex density 60kg/m3, or equivalent in fire resistance class B/ B_L-s3-d0.

LS: Specified insulation with minimum insulation length of 1000 mm, including through the penetration itself.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Steel pipe diameter (Ø) 15 – 219.1 mm	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Steel pipe (d) Ø 15 – 219.1 mm, pipe wall thickness (t): 1.0 – 4.5 mm. U/C + C/C.				
Pipe in wall Ø 15 mm insulated with stone wool*, thickness 25 mm. Max. opening in wall: Ø 85 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 52**
Pipe in wall Ø 15 mm insulated with stone wool*, thickness 50 mm. Max. opening in wall: Ø 128 mm.	6 x 25 mm	With or without backing	**EI 120**	**Figure 52**
Pipe in wall Ø 35 mm insulated with stone wool*, thickness 25 mm. Max. opening in wall: Ø 105 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 52**
Pipe in wall Ø 35 mm insulated with stone wool*, thickness 50 mm. Max. opening in wall Ø 155 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 52**
Pipe in wall Ø 42.2 mm insulated with stone wool*, thickness 25 mm. Max. opening in wall: Ø 112 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 52**
Pipe in wall Ø 42.2 mm insulated with stone wool*, thickness 50 mm. Max. opening in wall: Ø 162 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 52**
Pipe in wall Ø 219.1 mm insulated with stone wool*, thickness 25 mm. Max. opening in wall: Ø 298 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 52**
Pipe in wall Ø 219.1 mm insulated with stone wool*, thickness 50 mm. Max. opening in wall: Ø 339 mm.	10 x 25 mm	With or without backing	**EI 90**	**Figure 52**
Pipe in floor Ø 219.1 mm insulated with stone wool*, thickness 25 mm. Max. opening in floor: Ø 300 mm.	15 x 25 mm	With or without backing	**EI 120**	**Figure 53**

Figure 52
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 6-10 mm and a depth of 25 mm around insulated pipe.

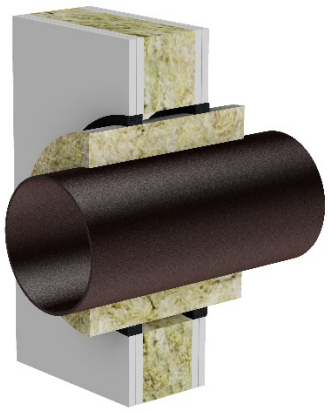
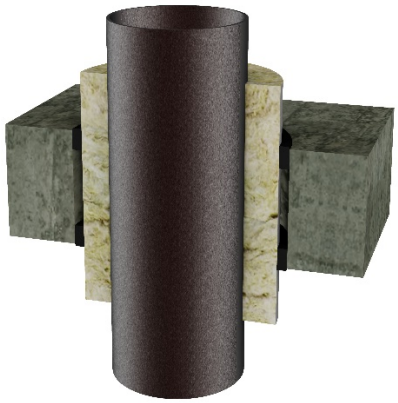


Figure 53
Apply the sealant around the pipe on both sides of the floor. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around insulated pipe.



Explanations of abbreviations for pipe end configuration in test (see NS-EN 1366-3: 2009, Table 2):

U/C: Uncapped /Capped. Open /Closed, unventilated pipe systems, for example cold or hot water pipes.

C/C: Capped /Capped. Closed /Closed. Closed pipe systems with permanent water pressure.

Explanations of abbreviations for pipe insulation (see NS-EN 1366-3: 2009, Table 1):

*Pipe insulated with 25 and 50 mm thick stone wool, density 90kg/m3.

LS: Specified insulation with minimum insulation length of 700 mm in wall, including through the penetration itself.

LS: Specified insulation with minimum insulation length of 1000 mm in floor, including through the penetration itself.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

Flexible and rigid wall ≥ 100 mm and rigid floor ≥ 150 mm				
Cable bundle, electrical cable conduit bundle diameter (Ø) ≤ 121	**Width × depth FT Graphite from two sides (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Cable bundle and electrical cable conduit bundle (d) Ø ≤ 121, Copper cable ≤ Ø 31 mm + fibre optic cable.				
Cable bundle (d) ≤ Ø 121 mm, with cable (d) ≤ Ø31 mm. Max. opening in wall or floor: Ø 151 mm.	15 x 25 mm	With or without backing	**EI 120**	**Figure 54**
Electrical cable conduit in bundle (d) ≤ Ø 110 mm, cable conduit (d) ≤ Ø 20 mm. Or isolated electrical cable conduit (d) ≤ Ø 110 mm. Max. opening in wall or floor: Ø 140 mm.	15 x 25 mm	With or without backing	**EI 120**	**Figure 55**

Figure 54
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the cable bundle.

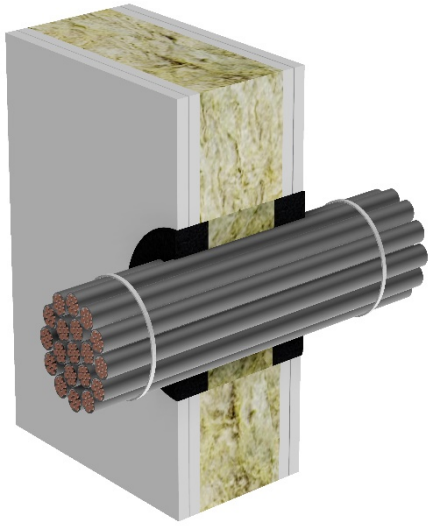
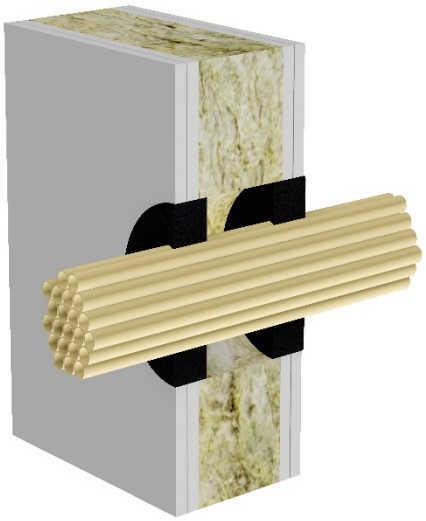


Figure 55
Apply the sealant around the pipe on both sides of the wall. Apply FT Graphite to a joint width of 15 mm and a depth of 25 mm around the conduit bundle.



FIRESAFE FT Graphite

Flexible wall ≥ 100 mm				
Wall box PE-X sanibox diameter (Ø)	**Width × depth FT Graphite from one side (mm)**	**Backing, type, density, thickness (mm)**	**Fire resistance class**	**See detail, figure:**
Wall box PE-X sanibox (d) Ø 51 mm				
Outer diameter of plastic PE-X (d) Ø 51 mm. Pipes inside og the box (d) Ø 12 mm. Max. opening in wall: Ø 73 mm.	10 x 25 mm	With or without backing	**EI 60**	**Figure 56**

Figure 55

Apply the sealant around the box on one side of the wall. Apply FT Graphite to a joint width of 10 mm and a depth of 25 mm around the box.

The PE-X sanibox must be in angle 90 ° in relation to wall.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no

FIRESAFE FT Graphite

PLASTIC PIPE: TYPE OF PLASTIC AND EXAMPLE OF PRODUCT NAME AND PIPE MANUFACTURER

PE polyethylene:			
- PE-LD + PE-HD polyethylene. - PEX-AL-PEX AluEX heating + water supply, Al composite pipe or multi - layer pipe. - PE-Xa high pressure + high temperature pipe	**PE-LD + PE-HD example type:** Wavin TS. Agru PE 100. Agru PE 100-RC.	**AluPEX example type:** Uponor MLC. TECEflex. Geberit Mepla. Keketil Lelox KM 110. Rehau Rautitan Stabil. Henco AluPEX. Begetube Alpex.	**PE-Xa example type:** Uponor Aqua. Geberit Mepla. KE KELIT KELOX KM 110. Rehau Rautitan Flex. Rehau Rautitan Stabil.

PP polypropylene:				
- PP-R high pressure + high temperature pipe - PP-MD noise-dampened. - PP-MX noise-dampened.	**PP example type:** Dyka PP. Agru PP-H.	**PP-R example type:** Aquatherm Blue. Aquatherm Green. aquatechnik PP-R. Akatherm PP-R. Wavin Pilsa.	**PP-MD example type:** Uponor Decibel. Gebrit Silent-PP. Pipelife Master 3. Rehau Raupiano Plus. Poloplast Polo-Kal NG/3S. Wavin SiTech / AS. Valsir Silere / Triplus.	**PP-MX example type:** Gebrit Silent-Pro

DOCUMENTATION INFORMATION

A list of areas of application and fire resistance ratings is shown in these installation instructions.

Other documentation such as product data sheets, safety data sheets (SDS) and declarations of performance (DoP) can be downloaded from www.firesafe.no.

Product certification with/by declaration of performance; for more information, see certification of CE-marked construction products through ETA on www.eota.eu/

Always consult www.firesafe.no for the latest versions of installation instructions, product data sheets and the declaration of performance (DoP), as product development and testing are continuous processes at FIRESAFE AS.

Contact the technical department at FIRESAFE for other **EI** requirements, non-standardised solutions or complex, project-specific requirements; e-mail: firmapost@firesafe.no.

Firesafe AS, Robsrudskogen 15, PO Box 6411 Etterstad, NO-0605 Oslo, Norway Telephone: +47 09 110. E-mail: firmapost@firesafe.no