



## ORYX® Grafite FR

Version 1.1, 01-05-2017 (English)

### ORYX®, passion for passive fire protection

*ORYX® is the specialist in passive fire protection for buildings. Thanks to our passionate expertise and extensive product range, ORYX® provides solutions for countless applications in the field of fire-resistant load-bearing structures, fire-resistant compartments and the creation of fire-resistant penetrations. All products and applications have a CE-label and were tested in line with European standards and can therefore be used right across Europe.*

*Our specialists are always ready to provide you with technical advice and support.*

### PRODUCT DESCRIPTION

**ORYX® Grafite FR** is an intumescent sealant based on acrylic that expands in the event of fire. Because this product creates pressure when it expands, it ensures fire-resistant sealing of plastic pipes (up to 55 mm diameter) and flammable insulation material around plastic or metal pipes or cable bundles.

#### CHARACTERISTICS

- CE label for fire-resistant applications
- Tested constructions to fire-resistance performance EI 240 (EN 13501-2)
- Tested in countless constructions in line with European standards EN 1366-3
- Effective adhesion to the most diverse building materials, incl. porous surfaces without primer
- Water-based
- Easy to apply and clean
- Dries fast
- Odourless and halogen-free
- Can be painted when dry

#### APPLICATIONS

- Around penetrations of small-diameter plastic pipes (up to 55 mm)
- Around penetrations of metal pipes with flammable insulation
- Around small penetrations, such as electrical cables, cable bundles or small-diameter metal pipes
- Only to be used in solid walls or floors

#### FITTING GUIDELINES

- Apply with sealant gun
- Surface must be dry, clean and dust-free
- Can be used and stored between +2°C and +40°C
- Where necessary, insert backfill using mineral wool to achieve the required joint depth
- The surface may be smoothed using a moist trowel up to 5 minutes after application
- Clean with warm water and soap



**PACKAGING AND STORAGE**

- In 310 ml tubes
- Keep dry at temperatures between +2°C and +30°C

**LIMITATIONS**

Do not use for aquariums, swimming pools, or in areas that are in permanent contact with food, constant friction areas, or for structural glazing. It is the user's responsibility to understand the usage guidelines. We recommend carrying out a test beforehand.

**SAFETY REQUIREMENTS**

Wear appropriate safety clothing, gloves and protect eyes and face. Avoid contact with skin and eyes. Causes eye irritation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Only use in well-ventilated area. Keep out of the reach of children. Do not swallow. Contains fungicidal agents. For further information, please refer to the Safety Data Sheet.

**DISCLAIMER**

The content of this brochure has been compiled with the greatest possible care and is only intended for information purposes. The information contained herein does not constitute a partial or full guarantee or proposal for which we are liable. We reserve the right to change or alter product specifications.

All information about our products and applications can be found at [www.oryx.pro](http://www.oryx.pro)



FITTING INSTRUCTIONS

ANNEX A, FIRE-RESISTANCE FOR PENETRATIONS

Characteristics of the product and references to the assessment methods

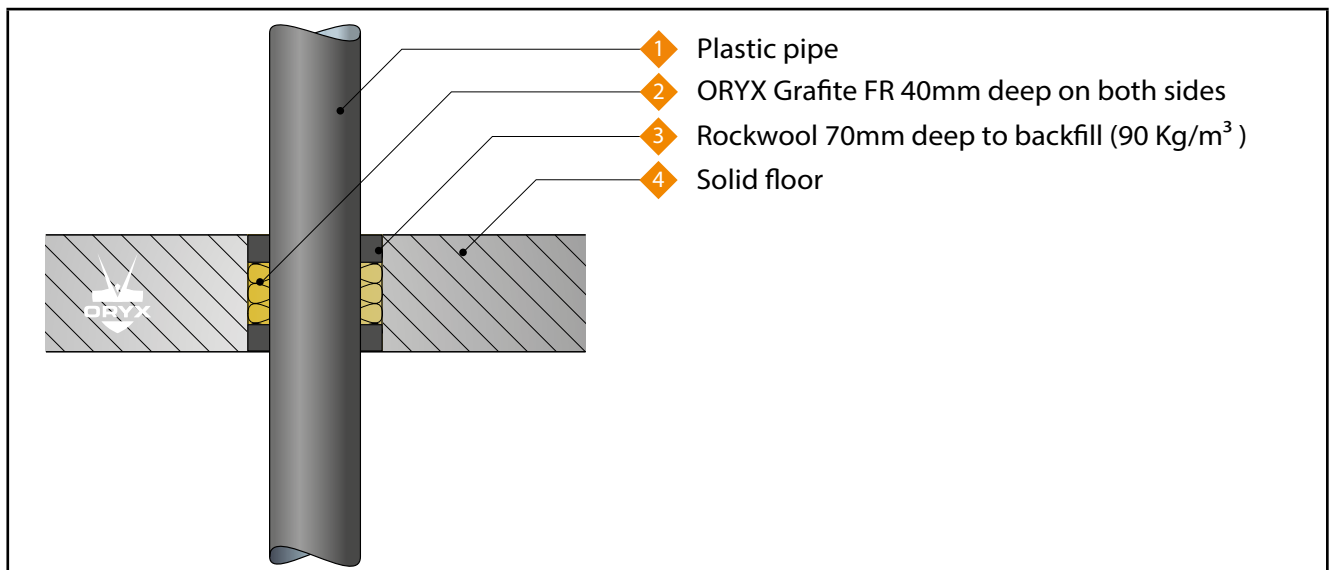
Product type: Sealant		Intended use: Penetration seal	
Minimum construction requirements	Basic requirements	Characteristics	
<b>BWR 1 Mechanical resistance and stability</b>			
-	None	Not relevant	
<b>BWR 2 Safety in case of fire</b>			
EN 13501-1	Reaction to fire	Reaction to fire class F	
EN 13501-2	Fire-resistance	Annex A	
<b>BWR 3 Hygiene, health and environment</b>			
EN 1026:2000	Air permeability (material characteristic)	No characteristic specified	
ETAG 026-2, Annex C	Water permeability (material characteristic)	No characteristic specified	
Manufacturer's declaration	Release of hazardous substances	Usage category: IA1, S/W3 Manufacturer's declaration	
<b>BWR 4 Safety use</b>			
EOTA TR 001:2003	Mechanical resistance and stability	No characteristic specified	
EOTA TR 001:2003	Resistance against denting/movement	No characteristic specified	
EOTA TR 001:2003	Gluing	No characteristic specified	
<b>BWR 5 Noise protection</b>			
EN 10140-2/ EN ISO 717-1	Airborne noise insulation	No characteristic specified	
<b>BWR 6 Energy efficiency and thermal insulation</b>			
EN 12664, EN 12667 or EN 12939	Thermal characteristics	No characteristic specified	
EN ISO 12572 EN 12086	Water-vapour permeability	No characteristic specified	
<b>General aspects relating to use</b>			
EOTA TR 024:2009, clause 3.1.11 & 3.1.12	Durability and maintenance	$Y_{2(-5^{\circ}/70^{\circ}C)}$	
<b>BWR 7 Sustainable use of natural resources</b>			
-	-	No characteristic specified	

Product(s)	Intended use	Level(s) or class(es)	System
Fire-resistant sealing material	For fire compartmentalisation and/or fire safety or fire protection	All	1

**A.1 Solid floor constructions with a thickness of at least 150 mm**

**A.1.1 Penetration seal with plastic pipes**

Penetration seal: Plastic pipes placed centrally with 40 mm deep ORYX® Grafite FR on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing (full depth )





**A.1.1.1**

Penetrations	Aperture diameter (mm)	Classification
<b>PVC-U pipe in line with EN 1329-1, EN 1452-2 and EN 1453-1 <sup>1</sup></b>		
Diameter 82 mm, wall thickness 2 mm	132	E 15-C/U, E 15-U/C, E 15-C/C
<b>PE pipe in line with EN 1519-1, EN 12201-2 and EN 12666-1, ABS pipe in line with EN 1455-1 and SAN+PVC pipe in line with EN 1565-1 <sup>2</sup></b>		
Diameter 75 mm, wall thickness 3 mm	125	E 60-C/U, E 60-U/C, E 60-C/C EI 45-C/U, EI 45-U/C, EI 45-C/C
<b>MLCP <sup>3</sup> pipe in line with EN 21003-1 and EN 21003-2</b>		
Diameter 16 mm, wall thickness 2.4 mm	36	E 240-C/U, E 240-U/C, E 240-C/C EI 90-C/U, EI 90-U/C, EI 90-C/C
Diameter 20 mm, wall thickness 3 mm	50	EI 240-C/U, EI 240-U/C, EI 240-C/C
Diameter 25 mm, wall thickness 2.5 mm	55	E 240-C/U, E 240-U/C, E 240-C/C EI 20-C/U, EI 20-U/C, EI 20-C/C
Diameter 40 mm, wall thickness 4 mm	80	EI 90-C/U, EI 90-U/C, EI 90-C/C
Diameter 50 mm, wall thickness 4.5 mm	90	EI 20-C/U, EI 20-U/C, EI 20-C/C
Diameter 63 mm, wall thickness 6 mm	113	E 30-C/U, E 30-U/C, E 30-C/C EI 20-C/U, EI 20-U/C, EI 20-C/C
Diameter 90 mm, wall thickness 9 mm	150	EI 20-C/U, EI 20-U/C, EI 20-C/C

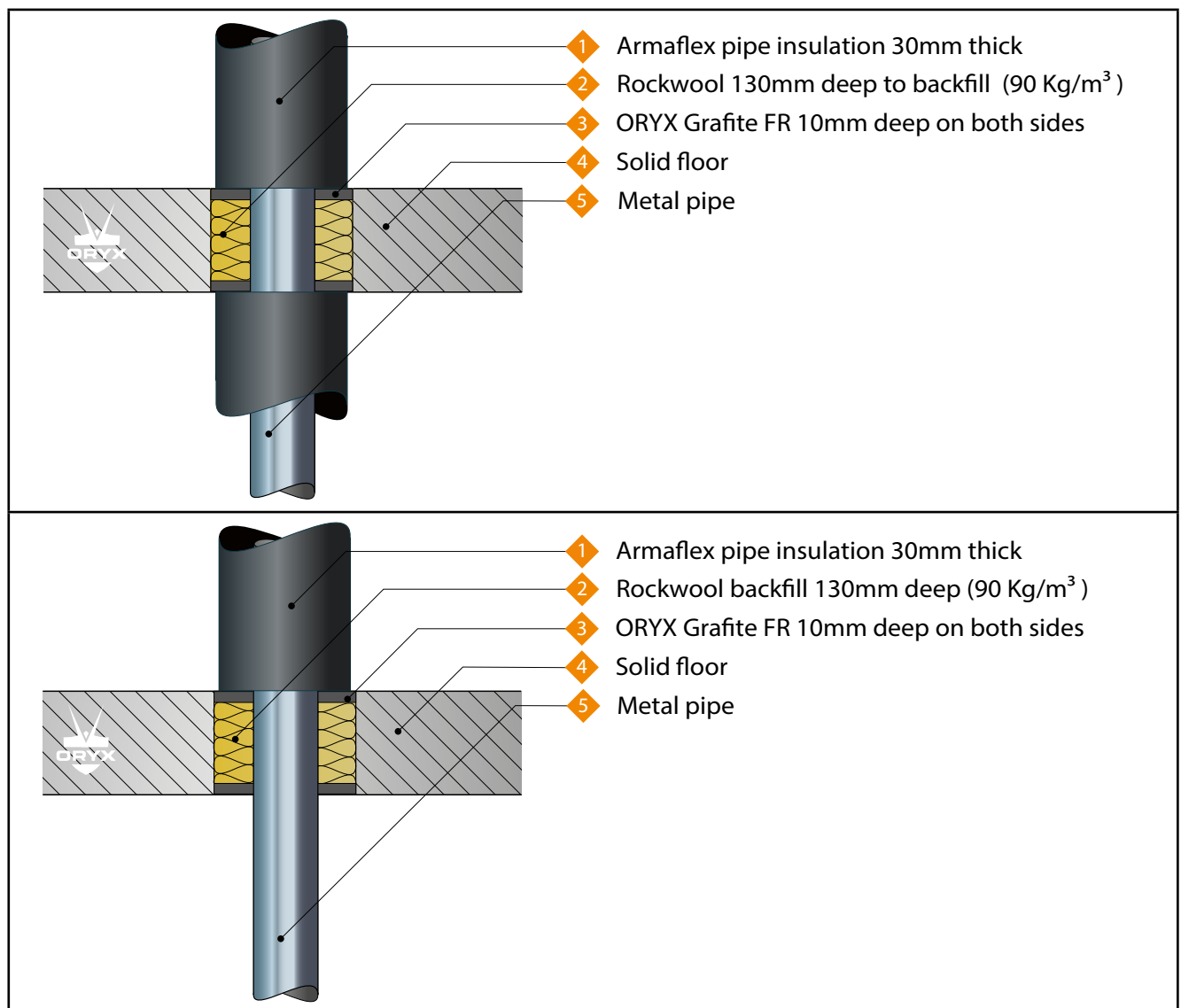
<sup>1</sup> In Germany, the pipes also comply with DIN 19531-10

<sup>2</sup> In Germany, the pipes also comply with DIN 19535-10

<sup>3</sup> Multilayer composite pipe – PE-RT/Al/PE-RT

**A.1.2 Penetration seal with steel pipe fitted with ‘continuous interrupted’ (CI) or at least 500 mm ‘local interrupted’ (LI) flammable insulation**

Penetration seal: Metal pipes with 30 mm Armaflex Class O full, partial or min. 500 mm insulated, or only on the upper side of the floor, interrupted insulation (CI or LI), applied in the middle of the aperture with 10 mm deep ORYX® Grafite FR sealant on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing to the entire depth.

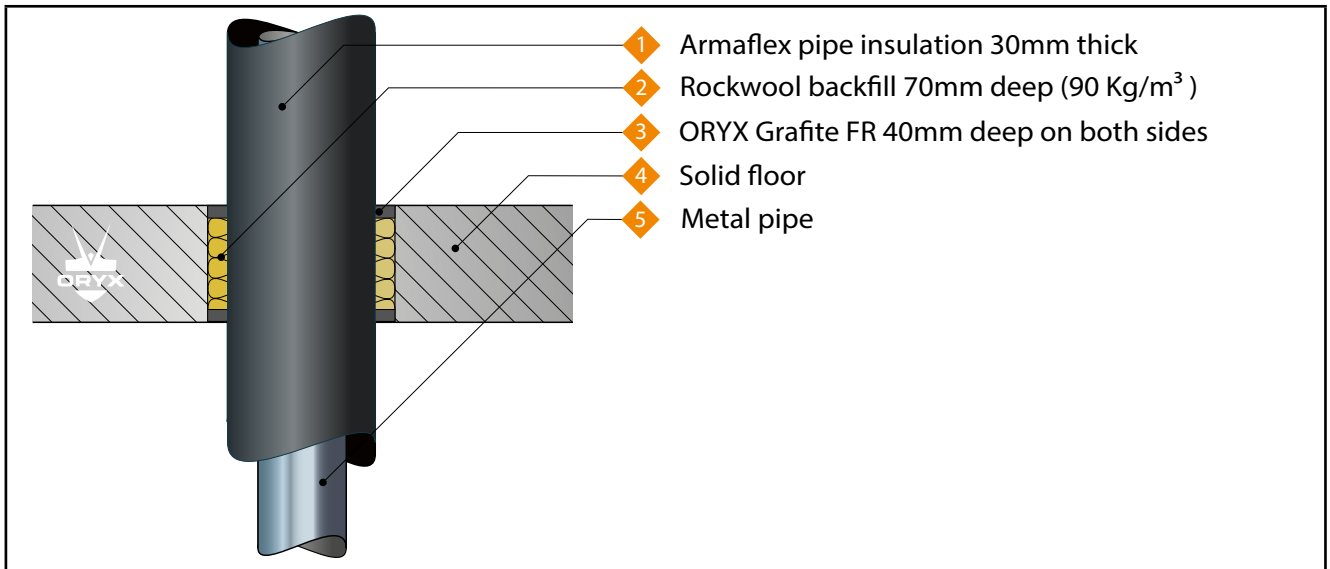


**A.1.2.1**

Penetrations	Aperture diameter (mm)	Classification
<b>Steel pipe</b>		
Diameter 40 mm, wall thickness 2 – 14.2 mm	112	EI 240-C/U

**A.1.3 Penetration seal with steel pipe including ‘continuous interrupted’ (CI) flammable insulation**

Penetration seal: Metal pipes with 30 mm Armaflex Class O fully insulated, applied in the middle of the aperture with 40 mm deep ORYX® Grafite FR sealant on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing to the entire depth.

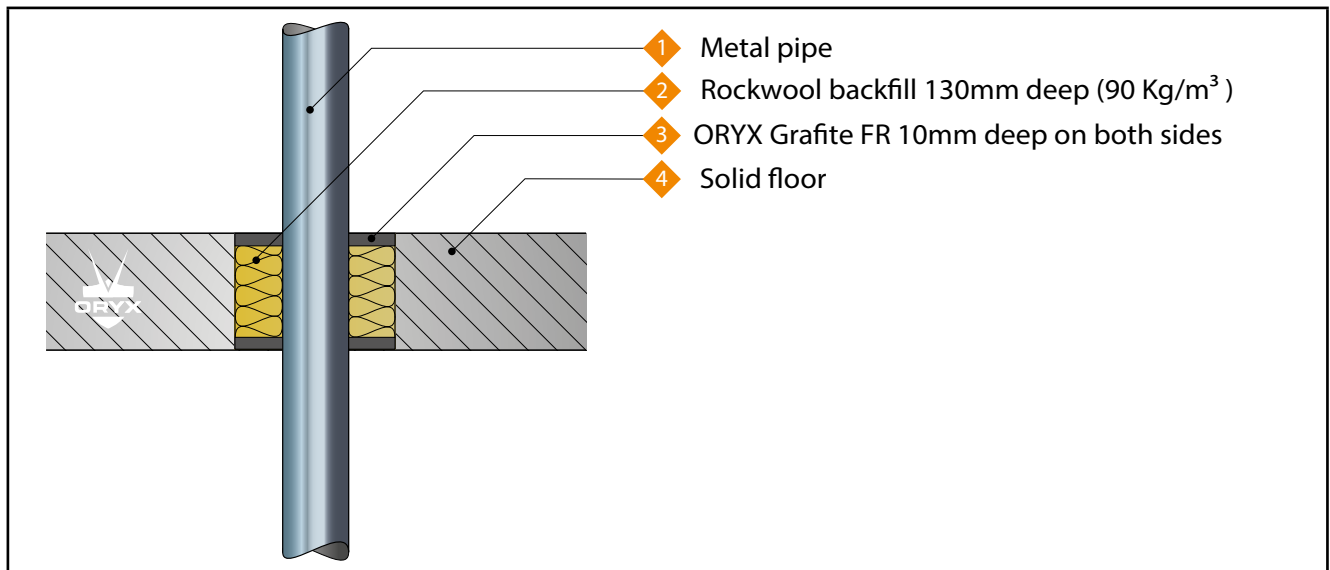


**A.1.3.1**

Penetrations	Aperture diameter (mm)	Classification
<b>Steel pipe</b>		
Diameter 89 mm, wall thickness 4 – 14.2 mm	190	EI 60-C/U

**A.1.4 Penetration seal with non-insulated metal pipes in solid floors  
min. 150 mm thick**

Penetration seal: Metal pipes without insulation, applied in the middle of the aperture with 10 mm deep ORYX® Grafite FR sealant on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing to the entire depth.



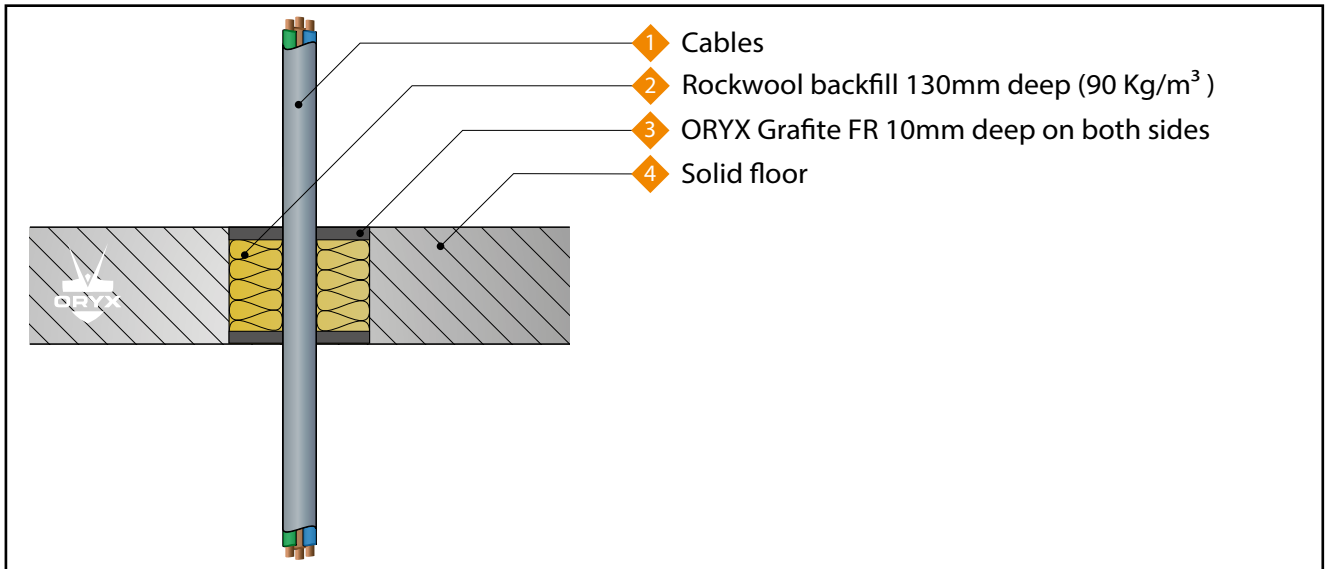
**A.1.4.1**

Penetrations	Aperture diameter (mm)	Classification
<b>Steel pipe</b>		
Diameter 40 mm, wall thickness 2 – 14.2 mm	112	E 240-C/U EI 60-C/U



**A.1.5 Penetration seal with cables**

Penetration seal: Electrical cables, applied in the middle of the aperture with 10 mm deep ORYX® Grafite FR sealant on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing to the entire depth.



**A.1.5.1**

Penetrations	Aperture diameter (mm)	Classification
Bundle of four Type A3 cables + one Type C3 cable	102	E 240, EI 90
one Type E cable	102	EI 240

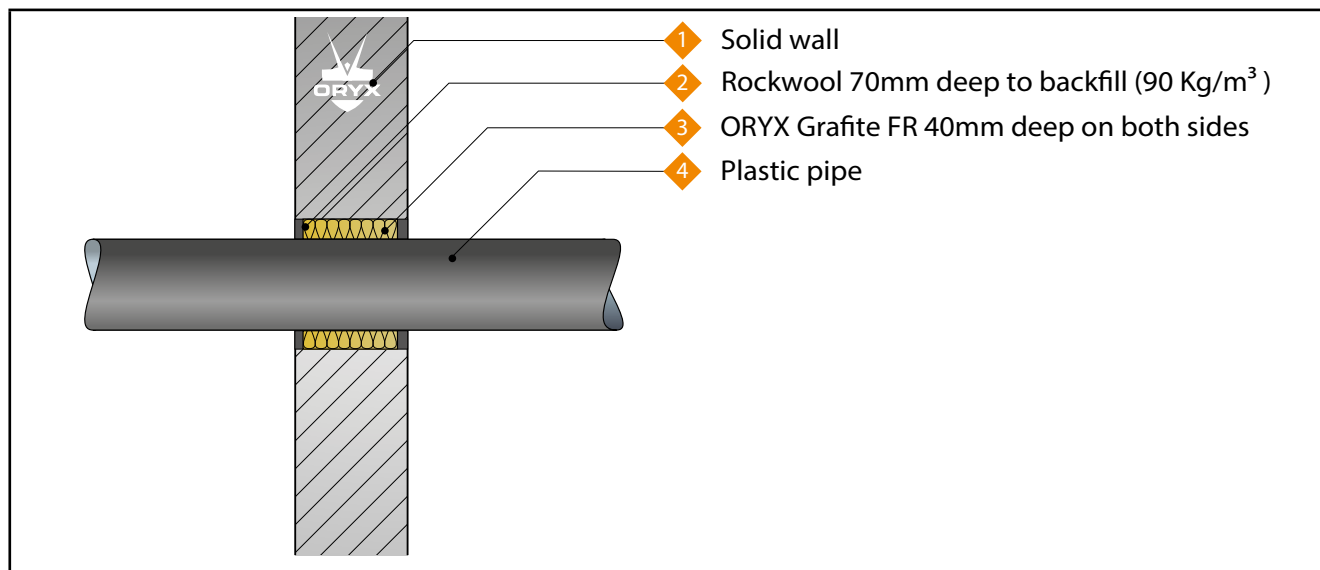
Type A3 cable = 5 x 1.5 mm<sup>2</sup> core HD604.5 electrical cable with XLPE insulation, EVA sleeve and 13 mm diameter

Type C3 cable = 4 x 95 mm<sup>2</sup> core HD603.3 electrical cable with PVC insulation, PVC sleeve and 42 mm diameter

Type E cable = 1 x 185 mm<sup>2</sup> core HD603.3 electrical cable with PVC insulation, PVC sleeve and 23-27 diameter

**A.2 Solid wall constructions with a wall thickness of at least 150 mm****A.2.1 Penetration seal with plastic pipe**

Penetration seal: Plastic pipes applied in the middle of the aperture with 40 mm deep ORYX® Grafite FR sealant on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing to the entire depth.



**A.2.1.1**

Penetrations	Aperture diameter (mm)	Classification
<b>PVC-U pipe in line with EN 1329-1, EN 1452-2 and EN 1453-1 <sup>1</sup></b>		
Diameter 40 mm, wall thickness 3 mm	80	EI 240-C/U, EI 240-U/C, EI 240-C/C
Diameter 55 mm, wall thickness 2.2 mm	105	EI 180-C/U, EI 180-U/C, EI 180-C/C
Diameter 82 mm, wall thickness 2.5 mm	132	E 30-C/U, E 30-U/C, E 30-C/C EI 15-C/U, EI 15-U/C, EI 15-C/C
<b>PE pipe in line with EN 1519-1, EN 12201-2 and EN 12666-1, ABS pipe in line with EN 1455-1 and SAN+PVC pipe in line with EN 1565-1 <sup>2</sup></b>		
Diameter 40 mm, wall thickness 3 mm	80	EI 240-C/U, EI 240-U/C, EI 240-C/C
Diameter 55 mm, wall thickness 3.2 mm	105	EI 120-C/U, EI 120-U/C, EI 120-C/C
<b>MLCP <sup>3</sup> pipe in line with EN 21003-1 and EN 21003-2</b>		
Diameter 16 mm, wall thickness 2.4 mm	36	EI 180-C/U, EI 180-U/C, EI 180-C/C
Diameter 20 mm, wall thickness 3 mm	50	EI 180-C/U, EI 180-U/C, EI 180-C/C
Diameter 25 mm, wall thickness 3 mm	55	E 180-C/U, E 180-U/C, E 180-C/C EI 90-C/U, EI 90-U/C, EI 90-C/C
Diameter 40 mm, wall thickness 4 mm	80	E 180-C/U, E 180-U/C, E 180-C/C EI 15-C/U, EI 15-U/C, EI 15-C/C
Diameter 50 mm, wall thickness 4.5 mm	90	E 60-C/U, E 60-U/C, E 60-C/C EI 15-C/U, EI 15-U/C, EI 15-C/C
Diameter 63 mm, wall thickness 6 mm	113	EI 60-C/U, EI 60-U/C, EI 60-C/C
Diameter 90 mm, wall thickness 9 mm	150	E 45-C/U, E 45-U/C, E 45-C/C EI 30-C/U, EI 30-U/C, EI 30-C/C

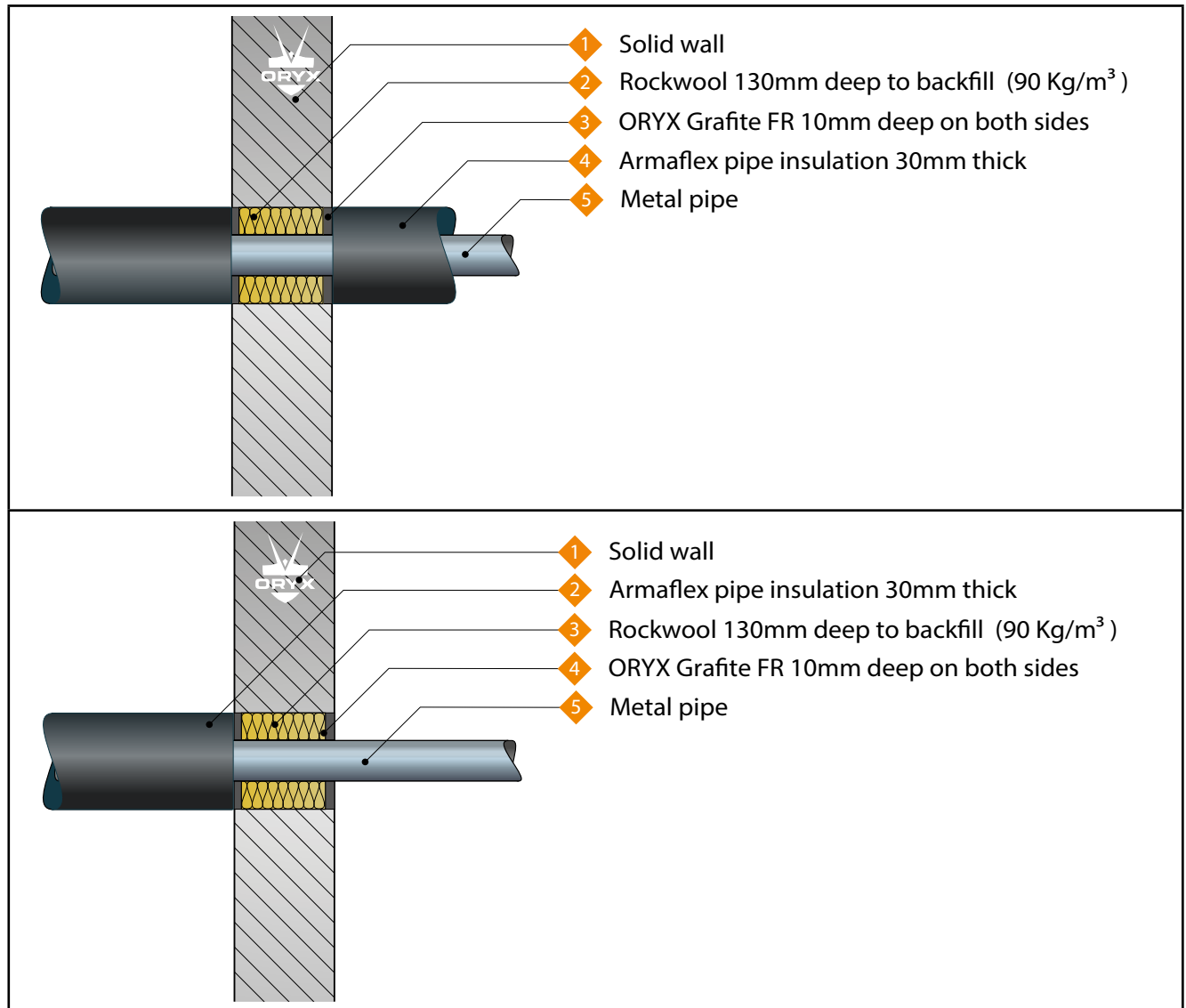
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<sup>2</sup> In Germany, the pipes also comply with DIN 19535-10

<sup>3</sup> Multilayer composite pipe – PE-RT/Al/PE-RT

**A.2.2 Penetration seal with steel pipe fitted with ‘continuous interrupted’ (CI) or at least 500 mm ‘local interrupted’ (LI) flammable insulation**

Penetration seal: Metal pipes with 30 mm Armaflex Class O fully insulated, applied in the middle of the aperture with 10 mm deep ORYX® Grafite FR sealant on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing to the entire depth.

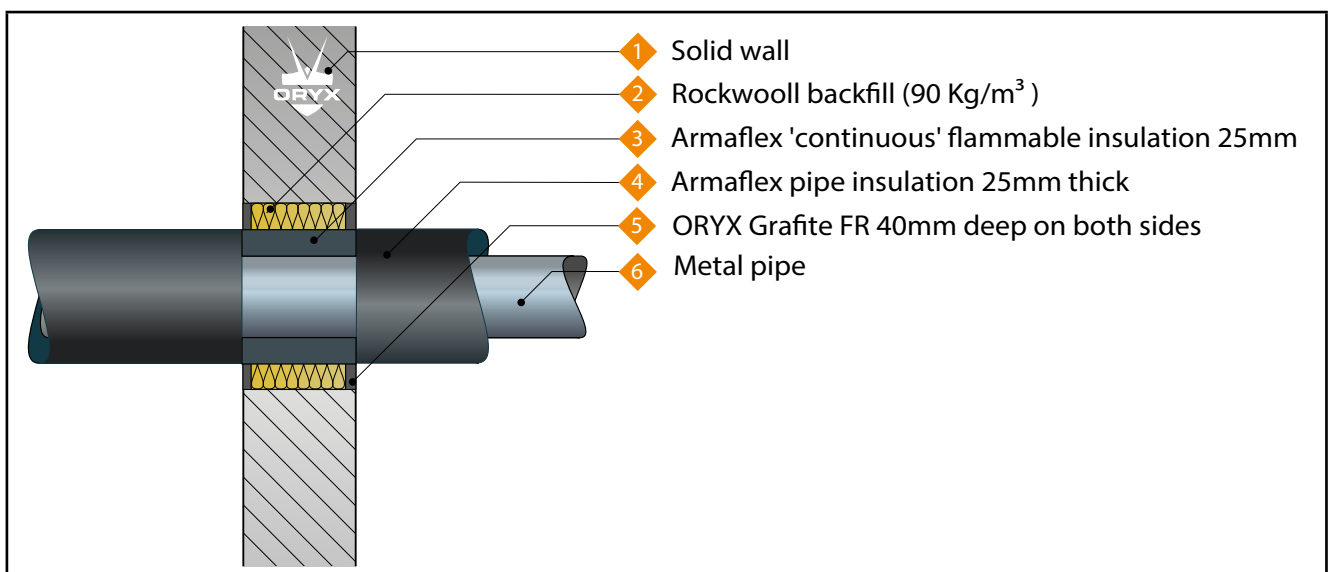


**A.2.2.1**

Penetrations	Aperture diameter (mm)	Insulation length (mm)	Classification
<b>Steel pipe</b>			
Diameter 40 mm, wall thickness 3.2 – 14.2 mm	80	Entire	E 240-C/U, EI 180-C/U
		Min. 500	
<b>Copper pipe</b>			
Diameter 35 mm, wall thickness 1.5 – 14.2 mm	80	Entire	E 240-C/U, EI 180-C/U
		Min. 500	E 240-C/U, EI 120-C/U

**A.2.3 Penetration seal with steel pipe including 'continuous' (CS) flammable insulation**

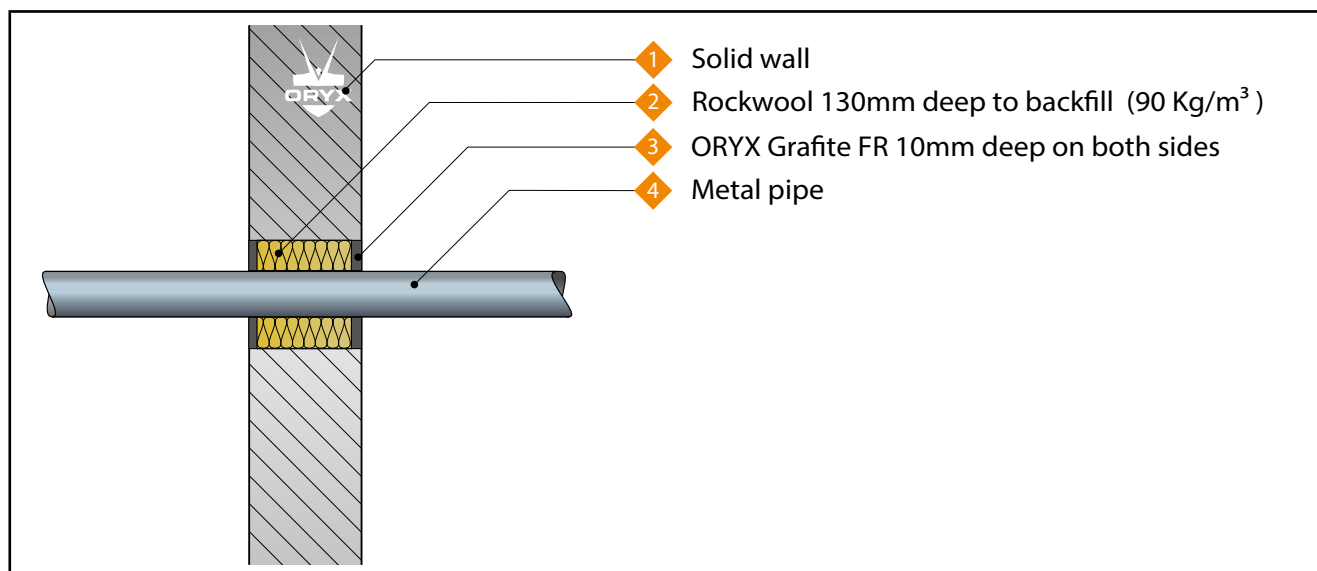
Penetration seal: Metal pipes with 25 mm Armaflex Class O fully insulated, applied in the middle of the aperture with 40 mm deep ORYX® Grafite FR sealant on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing to the entire depth.


**A.2.3.1**

Penetrations	Aperture diameter (mm)	Classification
<b>Steel pipe</b>		
Diameter 89 mm, wall thickness 4 - 14.2 mm	190	E 120-C/U, EI 60-C/U

**A.2.4 Penetration seal with non-insulated metal pipes in solid floors of at least 150 mm thick**

Penetration seal: Metal pipes without insulation, applied in the middle of the aperture with 10 mm deep ORYX® Grafite FR sealant on both sides of the floor with rockwool insulation 90 kg/m<sup>3</sup> backing to the entire depth.


**A.2.4.1**

Penetrations	Aperture diameter (mm)	Classification
<b>Steel pipe</b>		
Diameter 40 mm, wall thickness 3.2 – 14.2 mm	80	E 180-C/U, EI 20-C/U
<b>Copper pipe</b>		
Diameter 35 mm, wall thickness 1.5 – 14.2 mm	80	E 240-C/U, EI 30-C/U