QUICK REFERENCE GUIDE
FireMastic-HPE™ Systems

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FireMastic-HPE™ Systems

BOSS PASSIVE FIRE

Contents

Thankyou

Thankyou for purchasing or enquiring about the BOSS Fire Products. We manufacture our products to the highest quality standards, and we appreciate your supporting an Australian Owned company. If you have any feedback or questions relating to the product or it's designed purposes, please contact us on 1300 502 677 or +61 2 9531 8591 or info@bossfire.com.au.

Publication Version

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Introduction

This Quick Reference Guide is a document developed as a first reference for users to be able to determine if FireMastic-HPE™ might be suitable for their firestopping building application in Fire Rated Plasterboard Systems.

This document must be read in conjunction with the appropriate Technical Data Sheets, Safety Data Sheets and relevant Test or Assessment report relative to the listed system. You must follow adhere to the items outlined in the Important Information section outlined below before specifying, installing or certifying any BOSS Fire products or systems.

Important Information

Fire separation is a critical part of life safety in building design and must be treated carefully. Follow the steps below to help ensure your installation is carried out correctly and compliantly.

1. Always read and understand the appropriate certification relevant to the listed system contained in this guide. Test and Assessment reports are available at bossfire.com.au. If you cannot access a copy of a particular report please contact BOSS Fire® to request a copy. If you do not understand it, then please contact BOSS Fire® for technical clarification on the details contained therein.
2. Ensure the Approved Applications detailed in the Test and/or Assessment report is applicable to your construction details or for further details on 'as-tested' systems contact BOSS Fire® on the details below.
3. All BOSS Products must be installed in accordance with the manufacturer's specifications & certification or be subject of a Performance Solution.
4. This Quick Reference Guide must be read in conjunction with the product test or assessment reports. Always read and understand these documents carefully.
5. Always check your relevant Building Regulations, local laws and AS/NZS Standards to properly understand your obligations.
6. Ensure you have an accredited Certifier or 3rd party compliance inspector to check your proposed system before installation. Pre-approval can help to save significant costs and delays and avoid non-compliance.
7. NOTE: This guide will be updated from time to time, and you must ensure they are reviewing the most recent version at the time of installation. Please visit the BOSS Fire® website (bossfire.com.au) to check for further updates or contact us on the below details.
8. If you don't understand anything contained in this guide and would like clarification, contact BOSS Fire® on the details below.

Contact Details

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FireMastic-HPE™

FireMastic-HPE™ - Introduction

FireMastic-HPE™ is a graphite-based, High Pressure Exerting fire rated sealant used to reinstate the fire resistance performance of wall, floor & ceiling systems. Under heat, FireMastic-HPE™ will expand up to 40 times its volume and exerts pressure to the surrounding substrates leading to closure of the penetration. The integrity and insulation are then maintained by the stability of the remaining product char.

APPLICATIONS

- Use for a variety of different service services:
  - Insulated copper pipes
  - A/C pair coil & HVAC Bundles
  - Combustible Pipes:
    - uPVC & DWV Pipes
    - cPVC Sprinkler Pipes
    - PEX water pipes
    - PEX-AL Gas Pipes
    - PP-R Pipes (Aquatherm)
    - Kelox pipes
    - ABS & PE pipes
  - Electrical Cable Bundles
    - Power cables
    - Data & comms cables
    - Fire alarm cables

KEY BENEFITS

- Long life and Paintable
- Fire Rating up to FRL -/240/240
- Easy gunning & tooling
- Lubrizol Compatible Sealant for cPVC Sprinkler Pipes
- Ultra-low VOC
- Cost effective
- Packaging made from recycled materials




Table 1. Min 90 mm thick single layer 13 mm fire rated plasterboard walls

Service type	Service details	System details	FRL	Ref.
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 ~HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25 ^Non fire rated lagging can be substituted for fire rated lagging. Ref Clause FAS190335 4.1.26				
Power cable Bundle*	Up to 8 × 2.5 mm² 3 core power cables	Sealant to depth of plasterboard in max. 60 mm aperture finished flush	-/60/60	WF FAS 190335 Table 33 Page 63
Optical cable*	Single core 5 mm OD NBN cable.	20 mm × 20 mm fillet on non-exposed side only OR exposed side only	-/60/60	WF FAS 190335 Table 35 Page 64
PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in annular gap of up to 20mm finished flush both sides	-/60/60	WF FAS 190335 Table 11 Page 32
HVAC bundle*~^	Up to 10 mm / 15 mm insulated copper pipes with non-rated lagging, *Up to 2.5 mm² 2C+E TPS power cable *Up to 1.5 mm² 2C data cable. Up to 20 mm uPVC conduit	Sealed to depth of plasterboard in 80 mm aperture finished flush on penetrated side Second layer of plasterboard 150 mm x 150 mm over penetration, edges coated with a 13 mm x 13 mm fillet of BOSS FireMasitc-300	-/60/60	WF FAS 190335 Table 50 Page 81
HVAC bundle*~^	Services penetrating one side of wall: Up to 6.35 mm / 9.52 mm insulated copper pipes with non-rated lagging, *Up to 1.5 mm² 2C+E TPS power cable Up to 16 mm PVC flexible outlet pipe.	Sealed to depth of plasterboard in annular gap finished flush on penetrated side	-/60/60	

Table 2. Min 96 mm thick single layer 16 mm fire rated plasterboard walls

Service type	Service details	System details	FRL	Ref.
PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in maximum 20 mm annular gap finished flush both sides	-/90/90	WF FAS 190335 Table 11 Page 32

Table 3. Min 100 mm thick double layer 13 mm fire rated plasterboard walls

Service type	Service details	System details	FRL	Ref.
PVC pipe or conduit	Up to 40 × 1.9 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/120/120	WF FAS 190335 Table 11 Page 32
PVC pipe or conduit	Up to 125 × 9.2 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/60/60	
PVC pipe or conduit	Up to 125 × 1.8 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/30/30	
PVC pipe or conduit	**Services penetrating one side of wall:** Up to 40 × 1.9 mm	Sealant to depth of plasterboard with additional 10 mm × 10 mm fillet both sides	-/120/120	
PE pipe	40 × 3.7 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/30/30	
ABS pipe	Up to 40 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/120/120	
Insulated copper pipe	Up to 159 mm	32 mm glass wool insulation around pipe min. 1000 mm on both sides with sealant to a depth of 25 mm in annular gap finished flush both sides.	-/120/120	WF FAS 190335 Table 19 Page 47
Insulated copper pipe	Up to 159 mm	32 mm Armaflex® insulation around pipe min. 1000 mm on both sides with sealant to a depth of 25 mm in annular gap finished with additional 10 mm x 10 mm fillet both sides.	-/120/120	
Uponor water valves	**Services penetrating one side of wall:** Up to 52 mm	Sealed to depth of plasterboard in annular gap finished flush on penetrated side.	-/120/120	

Table 4. Min 116 mm thick double layer 13 mm fire rated plasterboard walls

Service type	Service details	System details	FRL	Ref.
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 ~HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25 ^Non fire rated lagging can be substituted for fire rated lagging. Ref Clause FAS190335 4.1.26				
Power cable bundle*	Up to 22 × 2.5 mm² 2C+E power cables.	Sealant to depth of plasterboard in 90 mm aperture finished flush	-/120/60	WF FAS 190335 Table 35 Page 65
Power cable bundle* & HDPE Pipe	• A1 - Bundle of up to 10 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 10 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 10 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm • B - Bundle of up to 2 × 1C × 1.5 mm² PVC/PVC cables – Ø18 mm – Ø21 mm • Up to 63 mm HDPE pipe	Sealant to depth of plasterboard applied in the voids around the cables and pipe in a maximum aperture of 300 mm wide x 100 mm high.	-/120/120	
Power cable bundle*	Up to 4 × 0.75 mm² TPS (fire alarm) power cables.	Sealant 25 mm deep in 30 mm aperture finished flush	-/120/120	
Power cable bundle*	Up to 6 × 2.5 mm² 2C+E power cables.	Sealant 25 mm deep in 57 mm aperture finished flush	-/120/120	
Power cable bundle*	Up to 1 × 16 mm² 2C+E power cables.	Sealant 25 mm deep in 40 mm aperture finished flush	-/120/120	
Alarm cable bundle*	Up to 4 × ELV extra low voltage alarm cables.	Sealant to depth of plasterboard in 57 mm aperture finished flush	-/120/90	WF FAS 190335 Table 35 Page 64
Fire alarm cable bundle*	Up to 8 x Fire alarm cables.	Sealant to depth of plasterboard with 15 mm annular gap finished flush both sides	-/120/120	
Data cable bundle*	Up to 2 × RG6 coax cables, Up to 2 × CAT6 cables, Up to 2 × 4 core security cables (7/0.20 mm). Up to 6 of any type of the above listed cables	20 mm deep in 40 mm aperture finished flush	-/120/120	
Data cable bundle*	Up to 38 x CAT6 data cables	Sealant to depth of 25 mm finished flush on both sides	-/120/60	
cPVC pipe	Up to 32 mm (43 mm OD)	Sealant to depth of plasterboard in 18.5 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/120/120	WF FAS 190335 Table 11 Page 32
uPVC pipe or conduit	Up to 20 mm	0 mm annular gap finished with a 15 mm × 15 mm fillet both sides	-/120/120	
uPVC pipe or conduit	Up to 20 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	

uPVC pipe	Up to 32 mm	Sealant 25 mm deep in 20 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
PEX/AL/PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in 5 – 20 mm annular gap finished flush both sides	-/120/120	
PEX/AL/PEX pipe	Up to 25 mm	Sealant to depth of plasterboard in 11.5 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
Pair coil~	Up to 9.5mm OD copper pipes with up to 35.5mm OD lagging Up to 15.8mm OD Copper Pipes with up to 41.1mm OD lagging	Sealed to depth of plasterboard in annular gap with additional 10 mm × 10 mm fillet both sides	-/90/90	WF FAS 190335 Table 52 Page 83
HVAC bundle*~^	Polyaire insulated copper pipe, *Up to 1.5 mm² 2C+E TPS power cable, *Up to 16 mm PVC flexible outlet pipe.	Sealed to depth of 13 mm in maximum 80 mm aperture finished flush on both sides	-/60/60	
HVAC bundle*~^	Up to 10 mm / 15 mm insulated copper pipes with non-rated lagging, *Up to 2.5 mm² 2C+E TPS power cable, *Up to 1.5 mm² 2C data cable. *Up to 20 mm uPVC conduit	Sealed to depth of plasterboard in maximum 80 mm aperture finished flush on both sides	-/60/60	
HVAC bundle*~	• Up to 16 mm × 10 mm insulated copper with 13 mm thick rubber foam lagging • *Up to 2.5 mm² 2C+E TPS power cable, • *Up to 1.5 mm² 2C data cable. • Up to 20 mm uPVC conduit	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	• Up to 16 mm × 10 mm insulated copper with 13 mm thick rubber foam lagging • *Up to 1.5 mm² 6 core electric cable.	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	• Up to 3 x 20 mm insulated copper with 13 mm thick Armaflex foamed nitrile rubber lagging • *Up to 2.5 mm² 2C+E TPS power cable • *Up to 1.5 mm² 2C data cable.	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	

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Table 5. Min 118 mm thick single layer 13 mm fire rated plasterboard walls

Service type	Service details	System details	FRL	Ref.
Power cable bundle	16 mm² 2C+E power cables.	Sealant to depth of plasterboard in 24 mm aperture finished flush	-/60/60	PF 23029 Specimen 7
Power cable bundle	16 mm² 2C+E power cables.	Sealant to depth of plasterboard in Max 3 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/60/60	PF 23031 Specimen 2
Power cable bundle	4 × 2.5 mm² 2C+E TPS cable bundle.	Sealant to depth of plasterboard in 4.5-6mm annular gap with additional 15 mm × 15 mm fillet both sides	-/60/60	PF 23029 Specimen 10
Power cable bundle	Services penetrating one side of wall: 4 × 2.5 mm² 2C+E TPS cable bundle.	Sealant to depth of plasterboard in Max 4 mm annular gap finished flush to penetrated side	-/60/60	PF 23030 Specimen 6
Fire alarm cable bundle	4 × 1.5mm² 2C+E fire alarm cable bundle.	Sealant to depth of plasterboard in Max 2.5 mm annular gap finished flush both sides	-/60/60	PF 23031 Specimen 3
Data cable bundle	2 × Cat6, 2 × COAX, 1 × security cable bundle.	Sealant to depth of plasterboard with Max 5.5 mm annular gap finished flush both sides	-/60/60	PF 23029 Specimen 8
Data cable bundle	2 × Cat6, 2 × COAX, 1 × security cable bundle.	Sealant to depth of plasterboard with Max 6 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/60/60	PF 23029 Specimen 9
Data cable bundle	Services penetrating one side of wall: 2 × Cat6, 2 × COAX, 1 × security cable bundle.	Sealant to depth of plasterboard in Max 7.5 mm annular gap finished flush on penetrated side	-/60/60	PF 23030 Specimen 8
cPVC pipe	Up to 32 mm (43 mm OD)	Sealant to depth of plasterboard in Max 6.5 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/60/60	PF 23029 Specimen 11
cPVC	Up to 40 mm (48.5 mm OD)	Sealant to depth of plasterboard in Max 7 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/60/60	PF 23030 Specimen 9
uPVC – NBN Conduit	25 mm	Sealant to depth of plasterboard in 6 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/60/60	PF 23029 Specimen 6
uPVC pipe or conduit	Services penetrating one side of wall: Up to 43 mm	Sealant to depth of plasterboard in 21.5 mm annular gap finished flush one side	-/90/90	WF FAS 190335 Table 11 Page 32
PVC pipe or conduit	Services penetrating one side of wall: 43 mm	Sealant to depth of plasterboard in 88 mm aperture finished flush	-/90/90	
PEX pipe	25 mm	Sealant to depth of plasterboard in 5.5 mm annular gap finished flush	-/45/30	PF 23030 Specimen 1
PEX pipe	25 mm	Sealant to depth of plasterboard in Max 4.5 mm annular gap finished flush. Additional BOSS 32 mm MaxiCollar both sides.	-/60/60	PF 23030 Specimen 3
PEX pipe	20 mm	Sealant to depth of plasterboard in Max 6 mm annular gap finished flush	-/60/60	PF 23029 Specimen 4
PEX pipe	Services penetrating one side of wall: 20 mm	Sealant to depth of plasterboard in Max 5 mm annular gap finished flush to penetrated side	-/60/60	PF 23030 Specimen 11
PE-Xa pipe	Services penetrating one side of wall: Up to 20 mm	Sealant to depth of plasterboard in 17.5 mm annular gap finished flush	-/90/90	WF FAS 190335 Table 11 Page 32

PE-Xa pipe	Services penetrating one side of wall: Up to 20 mm	Sealant to depth of plasterboard in 55 mm annular gap finished flush to penetrated side	-/60/60	WF FAS 190335 Table 11 Page 32
PEX/AL/PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in Max 20 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/60/60	PF 23029 Specimen 3
PEX/AL/PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in Max 5 mm annular gap both sides finished flush	-/60/60	PF 23029 Specimen 5
PEX/AL/PEX pipe	Services penetrating one side of wall: Up to 20 mm	Sealant to depth of plasterboard in Max 5.5 mm annular gap both sides finished flush	-/60/60	PF 23031 Specimen 9
HVAC bundle	1 × 15.5 mm + 9.5 mm pair coil with 19 mm + 17.5 mm insulation, 1 × TPS cable, 1 × Instrolex® control cable, 1 × 20 mm uPVC condensate drain.	Sealed to depth of plasterboard in Max 6.5 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/60/60	PF 23031 Specimen 1
Steel pipe	40 mm	Sealant to a depth of plasterboard in Max 8.5 mm annular gap with additional 30 mm × 30 mm fillet both sides	-/60/60	PF 23031 Specimen 10

Table 6. Min 130 mm thick double layer 13 mm fire rated plasterboard walls

Service type	Service details	System details	FRL	Ref.
Steel pipe	Up to 324 mm	75 mm insulation installed around pipe 300 mm on exposed face and 400 mm on non-exposed face with sealant to a depth of plasterboard in 5 mm annular gap finished flush both sides.	-/90/90	WF FAS 190335 Table 19 Page 47
Insulated copper pipe	Up to 15 mm	13 mm Armaflex® insulation around pipe 580 mm each side with sealant to a depth of 25 mm in annular gap finished flush both sides.	-/120/120	
Insulated copper pipe	Up to 25 mm	25 mm stone wool insulation around pipe 400 mm on each side with sealant to a depth of 16 mm in annular gap with additional 35 mm × 35 mm fillet both sides.	-/120/120	
Insulated copper pipe	Up to 60 mm	32 mm Armaflex® insulation around pipe min. 600 mm on both sides. Additional wrapping with P40 MAK Wrap extending 600 mm on both sides, with sealant to a depth of 25 mm finished flush both sides.	-/120/120	
Insulated copper pipe	Up to 100 mm	50 mm stone wool insulation around pipe min. 600 mm on both sides with sealant to a depth of 16 mm in annular gap with additional 35 mm × 35 mm fillet both sides.	-/120/120	

Table 7. Min 144 mm thick double layer 13 mm fire rated plasterboard walls

Service type	Service details	System details	FRL	Ref.
Power cable bundle	16 mm² 2C+E power cables.	Sealant to depth of plasterboard in 24 mm aperture finished flush	-/60/60	PF 23029 Specimen 7
cPVC pipe	Up to 50 mm (60.3 mm OD)	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/60	WF FAS 190335 Table 11 Page 32
uPVC pipe or conduit	Up to 40 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/120	
uPVC pipe or conduit	Up to 50 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/120	
uPVC pipe or conduit	Up to 80 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/90/90	
PEX/AL/PEX pipe	Up to 25 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/30	

Table 8. Min 156 mm thick double layer 13 mm fire rated plasterboard walls

Service type	Service details	System details	FRL	Ref.
PVC pipe	Services penetrating one side of wall: 43 mm	Sealant to depth of plasterboard in 90 mm aperture finished flush. with an additional baffle of 13 mm plasterboard both sides and 12 mm plywood fixed to steel angles inside cavity to penetrated side	-/120/120	WF FAS 190335 Table 11 Page 32

Table 9. Shaftliner / Shaftwall system with at least 2 layers of 13mm fire-rated plasterboard

Service type	Service details	System details	FRL	Ref.
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 ~HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25				
Power cable Bundle	16 mm² 2C+E power cables.	Sealant to depth of plasterboard in 24 mm aperture finished flush	-/60/60	PF 23029 Specimen 7
Power cable Bundle*	Up to 22 × 2.5 mm² 2C+E power cables.	Sealant to depth of plasterboard in 90 mm aperture finished flush	-/120/60	WF FAS 190335 Table 11 Page 32
Power cable Bundle* HDPE pipe	• A1 - Bundle of up to 10 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 10 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 10 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm • B - Bundle of up to 2 × 1C × 1.5 mm² PVC/PVC cables – Ø18 mm – Ø21 mm • Up to 63 mm HDPE pipe	Sealant to depth of plasterboard applied in the voids around the cables and pipe in a maximum aperture of 300 mm wide x 100 mm high.	-/120/120	

Power cable bundle*	Up to 4 × 0.75 mm² TPS (fire alarm) power cables.	Sealant 25 mm deep in 30 mm aperture finished flush	-/120/120	
Power cable bundle*	Up to 6 × 2.5 mm² 2C+E power cables.	Sealant 25 mm deep in 57 mm aperture finished flush	-/120/120	
Power cable bundle*	Up to 1 × 16 mm² 2C+E power cables.	Sealant 25 mm deep in 40 mm aperture finished flush	-/120/120	
Alarm cable bundle*	Up to 4 × ELV extra low voltage alarm cables.	Sealant to depth of plasterboard in 57 mm aperture finished flush	-/120/90	WF FAS 190335 Table 35 Page 64
Fire alarm cable bundle*	Up to 8 x Fire alarm cables.	Sealant to depth of plasterboard with 15 mm annular gap finished flush both sides	-/120/120	
Data cable bundle*	Up to 2 × RG6 coax cables, Up to 2 × CAT6 cables, Up to 2 × 4 core security cables (7/0.20 mm). Up to 6 of any type of the above listed cables	20 mm deep in 40 mm aperture finished flush	-/120/120	
Data cable bundle*	*Up to 38 x CAT6 data cables	Sealant to depth of 25 mm finished flush on both sides	-/120/60	
cPVC pipe	Up to 32 mm (43 mm OD)	Sealant to depth of plasterboard in 18.5 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/120/120	WF FAS 190335 Table 11 Page 32
cPVC pipe	Up to 50 mm (60.3 mm OD)	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/60	
uPVC pipe or conduit	Up to 20 mm	0 mm annular gap finished with a 15 mm × 15 mm fillet both sides	-/120/120	
uPVC pipe or conduit	Up to 20 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
uPVC pipe or conduit	Up to 32 mm	Sealant 25 mm deep in 20 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
uPVC pipe or conduit	Up to 40 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/120	
uPVC pipe or conduit	Up to 50 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/120	
uPVC pipe or conduit	Up to 80 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/90/90	
PVC pipe or conduit	Up to 40 × 1.9 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/120/120	
PVC pipe or conduit	Up to 125 × 9.2 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/60/60	
PVC pipe or conduit	Up to 125 × 1.8 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/30/30	
PVC pipe or conduit	**Services penetrating one side of wall:** Up to 40 × 1.9 mm	Sealant to depth of plasterboard with additional 10 mm × 10 mm fillet both sides	-/120/120	WF FAS 190335 Table 11 Page 32
PVC pipe or conduit	**Services penetrating one side of wall:** 43 mm	Sealant to depth of plasterboard in 90 mm aperture finished flush with an additional baffle of 13 mm plasterboard both sides and 12 mm plywood fixed to steel angles inside cavity to penetrated side	-/120/120	

PE pipe	40 × 3.7 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/30/30	
ABS pipe	Up to 40 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/120/120	
PEX/AL/PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in 5 – 20 mm annular gap finished flush both sides	-/120/120	
PEX/AL/PEX pipe	Up to 25 mm	Sealant to depth of plasterboard in 11.5 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
PEX/AL/PEX pipe	Up to 25 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/30	
Uponor water valves	**Services penetrating one side of wall:** Up to 52 mm	Sealed to depth of plasterboard in annular gap finished flush on penetrated side.	-/120/120	WF FAS 190335 Table 19 Page 47
Steel pipe	Up to 324 mm	75 mm insulation installed around pipe 300 mm on exposed face and 400 mm on non-exposed face with sealant to a depth of plasterboard in 5 mm annular gap finished flush both sides.	-/90/90	
Insulated copper pipe	Up to 15 mm	13 mm Armaflex® insulation around pipe 580 mm each side with sealant to a depth of 25 mm in annular gap finished flush both sides.	-/120/120	
Insulated copper pipe	Up to 25 mm	25 mm stone wool insulation around pipe 400 mm on each side with sealant to a depth of 16 mm in annular gap with additional 35 mm × 35 mm fillet both sides.	-/120/120	
Insulated copper pipe	Up to 60 mm	32 mm Armaflex® insulation around pipe min. 600 mm on both sides. Additional wrapping with P40 MAK Wrap extending 600 mm on both sides, with sealant to a depth of 25 mm finished flush both sides.	-/120/120	
Insulated copper pipe	Up to 100 mm	50 mm stone wool insulation around pipe min. 600 mm on both sides with sealant to a depth of 16 mm in annular gap with additional 35 mm × 35 mm fillet both sides.	-/120/120	
Insulated copper pipe	Up to 159 mm	32 mm glass wool insulation around pipe min. 1000 mm on both sides with sealant to a depth of 25 mm in annular gap finished flush both sides.	-/120/120	
Insulated copper pipe	Up to 159 mm	32 mm Armaflex® insulation around pipe min. 1000 mm on both sides with sealant to a depth of 25 mm in annular gap finished with additional 10 mm x 10 mm fillet both sides.	-/120/120	
Pair coil	Up to 9.5mm OD copper pipes with up to 35.5mm OD lagging Up to 15.8mm OD Copper Pipes with up to 41.1mm OD lagging,	Sealed to depth of plasterboard in annular gap with additional 10 mm × 10 mm fillet both sides	-/90/90	WF FAS 190335 Table 52 Page 83
HVAC bundle*~^	Polyaire© insulated copper pipe, Up to 1.5 mm² 2C+E TPS power cable, Up to 16 mm PVC flexible outlet pipe.	Sealed to depth of 13 mm in maximum 80 mm aperture finished flush on both sides	-/60/60	

HVAC bundle*~^	Up to 10 mm / 15 mm insulated copper pipes with non-rated lagging, Up to 2.5 mm² 2C+E TPS power cable, Up to 1.5 mm² 2C data cable. Up to 20 mm uPVC conduit	Sealed to depth of plasterboard in maximum 80 mm aperture finished flush on both sides	-/60/60	
HVAC bundle*~	Up to 16 mm × 10 mm insulated copper with 13 mm thick rubber foam lagging Up to 2.5 mm² 2C+E TPS power cable, Up to 1.5 mm² 2C data cable. Up to 20 mm uPVC conduit	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	Up to 16 mm × 10 mm insulated copper with 13 mm thick rubber foam lagging Up to 1.5 mm² 6 core electric cable.	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	Up to 3 x 20 mm insulated copper with 13 mm thick Armaflex foamed nitrile rubber lagging Up to 2.5 mm² 2C+E TPS power cable, Up to 1.5 mm² 2C data cable.	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	

Table 10. Min 75mm thick Rigid walls – AAC/Hebel, Speedpanel/Korok, Concrete/Masonry

Service type	Service details	System details	FRL	Ref.
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 ~HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25				
Power cable bundle*	Bundle of 22 × TPS cables - 2C+E 2.5 mm²	25 mm deep in 90 mm aperture annular gap finished flush both sides	-/120/60	WF FRT 180473 Penetration system A
Power cable bundle*	Up to 22 × 2.5 mm² 2C+E power cables.	Full depth of the wall and finished with 25 x 25 mm fillet on both sides	-/90/90	WF FAS 190335 Table 37 Page 67
Power cable bundle* in conduit	Up to 32 mm conduit (WT1.9 mm) Up to 8 × 2.5 mm² 2C+E TPS power cable inside the 32 mm conduit	20 mm deep in maximum 70 mm aperture finished flush both sides	-/90/90	
Data cable bundle*	Up to 38 x CAT6 data cables	Full depth of wall in annular gap finished flush both sides.	-/120/60	
Alarm cable bundle*	Up to 4 × ELV extra low voltage alarm cables.	25 mm deep in annular gap finished flush both sides	-/120/120	
Fire alarm cable bundle*	Up to 4 × 0.75 mm² TPS (fire alarm) power cables.	25 mm deep in annular gap finished flush both sides	-/120/120	
Data cable bundle*	Up to 2 × RG6 coax cables Up to 2 × CAT6 cable Up to 2 × 4 core security cables (7/0.20 mm)	20 mm deep in maximum 40 mm aperture finished flush both sides	-/120/120	
cPVC pipe	Up to 32 mm	20 mm deep in maximum aperture 83 mm with additional 15 mm × 15 mm fillet both sides	-/120/120	WF FAS 190335 Table 13 Page 39
cPVC pipe	60 mm	25 mm deep in 20 mm annular gap finished flush both sides	-/120/-	WF FRT 180473 Penetration system M
uPVC pipe	Up to 20 mm	24 mm aperture with a surface seal only both sides	-/120/120	WF FAS 190335 Table 13 Page 39
uPVC pipe	Up to 25 mm	25 mm deep in annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
uPVC pipe	40 mm	10 mm deep in annular gap with additional 25 mm × 25 mm fillet both sides	-/120/90	
PE-Xa pipe	Up to 32 mm	25 mm deep with 19 mm annular gap finished flush both sides.	-/120/-	WF FRT 180473 Penetration system L
PE-Xa pipe	Up to 32 mm	25 mm deep in a maximum 60 mm aperture with additional 20 mm × 20 mm fillet both sides	-/120/120	WF FAS 190335 Table 11 Page 32
PEX/AL/PEX pipe	Up to 20 mm	25 mm deep in annular gap finished flush both sides – 40 mm aperture	-/120/120	
PEX/AL/PEX pipe	Up to 25 mm	20 mm deep in maximum 48 mm aperture with additional 20 mm × 20 mm fillet both sides – 48 mm aperture	-/120/120	

HVAC bundle*~	Up to 1 x 3/8" × 3/4" pair coil with 19 mm thick FR lagging Up to 1 × 2.5 mm² 3C+E TPS power cable Up to 1 × Cat6 cable Up to 1 × 20 mm uPVC condensate pipe (WT 1.4 mm).	20 mm deep in maximum 127 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	WF FAS 190335 Table 54 Page 86
HVAC bundle*~	Up to 1 × 3/8" × 5/8" pair coil with 13 mm thick FR lagging Up to 1 × 2.5 mm² 3C+E TPS power cable Up to 1 × Cat6 cable Up to 1 × 20 mm uPVC condensate pipe (WT 1.4 mm).	20 mm deep in maximum 127 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	Up to 1 × 3/8" × 3/4" pair coil with 19 mm thick FR lagging Up to 1 × 3/8" × 5/8" pair coil with 13 mm thick FR lagging Up to 1 × 32 mm type B copper pipe (WT 1.2 mm) with 25 mm thick lagging	20 mm deep in maximum 152 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	Up to 1 × 3/8" × 5/8" pair coil with 9 mm thick FR lagging Up to 2 × 2.5 mm² 3C+E TPS power cable Up to 2 × Cat6 cable Up to 1 × 20 mm uPVC condensate pipe (WT 1.4 mm)	20 mm deep in maximum 80 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	Up to 1 × 3/8" × 5/8" pair coil with 19 mm thick FR lagging Up to 1 × 2.5 mm² 3C+E TPS power cable Up to 1 × Cat6 cable Up to 1 × 20 mm uPVC condensate pipe (WT 1.4 mm)	20 mm deep in maximum 127 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	

Table 11. Min 101mm thick Rigid walls – AAC/Hebel, Speedpanel/Korok, Concrete/Masonry with local thickening

Service type	Service details	System details	FRL	Ref.
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17				
Power cable bundle*	Up to 22 × 2.5 mm² 2C+E power cables.	Full depth of wall in maximum 90 mm aperture gap finished flush both sides.	-/120/120	WF FAS 190335 Table 37 Page 67
Data cable bundle*	Up to 38 x CAT6 data cables.	Full depth of wall in annular gap finished flush both sides.	-/120/120	
uPVC pipe	30 - 40 mm	10 mm deep in annular gap with additional 25 mm × 25 mm fillet both sides	-/120/120	WF FAS 190335 Table 13 Page 39

Table 12. Cross Laminated Timber – Min 130mm Thick

Service type	Service details	System details	FRL	Ref.
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 ~HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25				
Power cable bundle*	32 mm conduit – 1.9 mm thick Up to 6 × 2.5 mm² 2C+E cable TPS cables inside 32 mm conduit	20 mm deep in annular gap both sides finished flush	-/90/90	WF FAS 190335 Table 45 Page 76
Power cable bundle*	Up to 16 mm² 3C+E cable	20 mm deep in annular gap both sides finished flush	-/90/90	
Power cable bundle*	40 mm aperture incorporating the following cables: Up to 2 x CAT6 cables Up to 2 x RG6 Coax cables Security cable 1 × Fig 8 cable 2 x Fire alarm cables	20 mm deep in annular gap both sides finished flush	-/90/90	
PEXa pipe	Up to 20 mm	20 mm deep in 20 mm annular gap in maximum 60 mm aperture, finished flush on both sides.	-/90/90	WF FAS 190335 Table 15 Page 41
	Up to 20.4 mm	25 mm deep in 12.5 mm annular gap in maximum 45 mm aperture, finished flush on both sides.	-/90/90	
PEX/AL/PEX and PE-Xb pipe	Up to 20 mm	25 mm deep in 20 mm annular gap in maximum 60 mm aperture, finished with 20 mm × 20 mm fillet of sealant on both sides.	-/90/90	
Kelox Plus pipe	Up to 25mm (with additional 13mm thick insulation)	20 mm deep in 16.5 mm annular gap in maximum 83 mm aperture, finished flush on both sides.	-/90/90	
HVAC bundle*~	Up to 3/8" × 3/4" pair coil with 19 mm thick FR lagging – 1.4 mm / 2.8 wall thickness Up to 20 mm condensation drainpipe – 1.8 mm wall thickness Up to 2.5 mm2 3C+E TPS cable Instrolex control cable	20 mm deep in annular gap in maximum 121 mm aperture, finished flush on both sides.	-/90/90	WF FAS 190335 Table 56 Page 88

Table 13. BOSS Batt aperture in walls -Min 100mm Thick

Service type	Service details	System details	FRL	Ref.
BOSS Batts – Ref Clause FAS190335 – 4.1.24				
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 ~HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25 ^Non fire rated lagging can be substituted for fire rated lagging. Ref Clause FAS190335 4.1.26				
Power cable bundle*	Up to 8 × 2.5 mm² 3 core power cables.	Sealant to depth of plasterboard in max. 60 mm aperture finished flush	-/60/60	WF FAS 190335 Table 33 Page 63
Power cable bundle*	Up to 22 × 2.5 mm² 2C+E power cables.	Sealant to depth of plasterboard in 90 mm aperture finished flush	-/120/60	WF FAS 190335 Table 35 Page 65
Power cable bundle*	• A1 - Bundle of up to 10 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 10 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 10 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm • B - Bundle of up to 2 × 1C × 1.5 mm² PVC/PVC cables – Ø18 mm – Ø21 mm • Up to 63 mm HDPE pipe	Sealant to depth of plasterboard applied in the voids around the cables and pipe in a maximum aperture of 300 mm wide x 100 mm high.	-/120/120	
Power cable bundle*	Up to 4 × 0.75 mm² TPS (fire alarm) power cables.	Sealant 25 mm deep in 30 mm aperture finished flush	-/120/120	
Power cable bundle*	Up to 6 × 2.5 mm² 2C+E power cables.	Sealant 25 mm deep in 57 mm aperture finished flush	-/120/120	
Power cable bundle*	Up to 1 × 16 mm² 2C+E power cables.	Sealant 25 mm deep in 40 mm aperture finished flush	-/120/120	
Power cable bundle*	Up to 22 × 2.5 mm² 2C+E power cables.	Full depth of wall in maximum 90 mm aperture gap finished flush both sides.	-/120/120	WF FAS 190335 Table 37 Page 67
Power (Conduit)*	Up to 32 mm conduit (WT1.9 mm) Up to 8 × 2.5 mm² 2C+E TPS power cable inside the 32 mm conduit	20 mm deep in maximum 70 mm aperture finished flush both sides	-/90/90	
Power cable bundle*	32 mm conduit – 1.9 mm thick Up to 6 × 2.5 mm² 2C+E cable TPS cables inside 32 mm conduit	20 mm deep in annular gap both sides finished flush	-/90/90	WF FAS 190335 Table 45 Page 76
Power cable bundle*	Up to 16 mm² 3C+E cable	20 mm deep in annular gap both sides finished flush	-/90/90	
Power cable bundle*	40 mm aperture including: Up to 2 x CAT6 cables Up to 2 x RG6 Coax cables Security cable 1 × Fig 8 cable 2 x Fire alarm cables	20 mm deep in annular gap both sides finished flush	-/90/90	

Optical cable*	Single core 5 mm OD NBN cable	20 mm × 20 mm fillet on non-exposed side only OR exposed side only	-/60/60	WF FAS 190335 Table 35 Page 64
Alarm cables*	Up to 4 × ELV extra low voltage alarm cables.	Sealant to depth of plasterboard in 57 mm aperture finished flush	-/120/90	WF FAS 190335 Table 35 Page 64
Fire alarm cable*	Up to 8 x Fire alarm cables.	Sealant to depth of plasterboard with 15 mm annular gap finished flush both sides	-/120/120	
Data cable bundle*	Up to 2 × RG6 coax cables, Up to 2 × CAT6 cables, Up to 2 × 4 core security cables (7/0.20 mm). Up to 6 of any type of the above listed cables	20 mm deep in 40 mm aperture finished flush	-/120/120	
Data cable bundle*	Up to 38 x CAT6 data cables	Sealant to depth of 25 mm finished flush on both sides	-/120/60	
cPVC pipe	Up to 32 mm (43 mm OD)	Sealant to depth of plasterboard in 18.5 mm annular gap with additional 15 mm × 15 mm fillet both sides	-/120/120	WF FAS 190335 Table 11 Page 32
cPVC pipe	Up to 50 mm (60.3 mm OD)	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/60	
uPVC pipe or conduit	Up to 20 mm	0 mm annular gap finished with a 15 mm × 15 mm fillet both sides	-/120/120	
uPVC pipe or conduit	Up to 20 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
uPVC pipe or conduit	Up to 32 mm	Sealant 25 mm deep in 20 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
uPVC pipe or conduit	Up to 40 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/120	
uPVC pipe or conduit	Up to 50 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/120	
uPVC pipe or conduit	Up to 80 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/90/90	
PVC pipe or conduit	Up to 40 × 1.9 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/120/120	
PVC pipe or conduit	Up to 125 × 9.2 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/60/60	
PVC pipe or conduit	Up to 125 × 1.8 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/30/30	
PVC pipe or conduit	Services penetrating one side of wall: Up to 40 × 1.9 mm	Sealant to depth of plasterboard with additional 10 mm × 10 mm fillet both sides	-/120/120	
PVC pipe or conduit	Services penetrating one side of wall: 43 mm	Sealant to depth of plasterboard in 90 mm aperture finished flush. with an additional baffle of 13 mm plasterboard both sides and 12 mm plywood fixed to steel angles inside cavity to penetrated side	-/120/120	

PE pipe	40 × 3.7 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/30/30	
ABS pipe	Up to 40 mm	Sealant to depth of plasterboard in 20 mm annular gap with additional 10 mm × 10 mm fillet both sides	-/120/120	
PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in annular gap of up to 20mm finished flush both sides	-/60/60	
PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in maximum 20 mm annular gap finished flush both sides	-/90/90	WF FAS 190335 Table 11 Page 32
PEX/AL/PEX pipe	Up to 20 mm	Sealant to depth of plasterboard in 5 – 20 mm annular gap finished flush both sides	-/120/120	
PEX/AL/PEX pipe	Up to 25 mm	Sealant to depth of plasterboard in 11.5 mm annular gap with additional 20 mm × 20 mm fillet both sides	-/120/120	
PEX/AL/PEX pipe	Up to 25 mm	Sealant to depth of plasterboard in 20 mm annular gap finished flush both sides	-/120/30	
PE-Xa pipe	Services penetrating one side of wall: Up to 20 mm	Sealant to depth of plasterboard in 17.5 mm annular gap finished flush	-/90/90	
PE-Xa pipe	Services penetrating one side of wall: Up to 20 mm	Sealant to depth of plasterboard in 55 mm annular gap finished flush to penetrated side	-/60/60	
Steel pipe	Up to 324 mm	75 mm insulation installed around pipe 300 mm on exposed face and 400 mm on non-exposed face with sealant to a depth of plasterboard in 5 mm annular gap finished flush both sides.	-/90/90	WF FAS 190335 Table 19 Page 47
Insulated copper pipe	Up to 15 mm	13 mm Armaflex® insulation around pipe 580 mm each side with sealant to a depth of 25 mm in annular gap finished flush both sides.	-/120/120	
Insulated copper pipe	Up to 25 mm	25 mm stone wool insulation around pipe 400 mm on each side with sealant to a depth of 16 mm in annular gap with additional 35 mm × 35 mm fillet both sides.	-/120/120	
Insulated copper pipe	Up to 60 mm	32 mm Armaflex® insulation around pipe min. 600 mm on both sides. Additional wrapping with P40 MAK Wrap extending 600 mm on both sides, with sealant to a depth of 25 mm finished flush both sides.	-/120/120	
Insulated copper pipe	Up to 100 mm	50 mm stone wool insulation around pipe min. 600 mm on both sides with sealant to a depth of 16 mm in annular gap with additional 35 mm × 35 mm fillet both sides.	-/120/120	
Copper	Up to 159 mm	32 mm glass wool insulation around pipe min. 1000 mm on both sides with sealant to a depth of 25 mm in annular gap finished flush both sides.	-/120/120	
Insulated copper pipe	Up to 159 mm	32 mm Armaflex® insulation around pipe min. 1000 mm on both sides with sealant to a depth of 25 mm in annular gap finished with additional 10 mm x 10 mm fillet both sides.	-/120/120	
Pair coil	Up to 9.5mm OD copper pipes with up to 35.5mm OD lagging Up to 15.8mm OD Copper Pipes with up to 41.1mm OD lagging,	Sealed to depth of plasterboard in annular gap with additional 10 mm × 10 mm fillet both sides	-/90/90	WF FAS 190335 Table 54 Page 86

HVAC bundle*~^	Polyaire© insulated copper pipe, Up to 1.5 mm² 2C+E TPS power cable, Up to 16 mm PVC flexible outlet pipe.	Sealed to depth of 13 mm in maximum 80 mm aperture finished flush on both sides	-/60/60	
HVAC bundle*~^	Up to 10 mm / 15 mm insulated copper pipes with non-rated lagging, Up to 2.5 mm² 2C+E TPS power cable, Up to 1.5 mm² 2C data cable. Up to 20 mm uPVC conduit	Sealed to depth of plasterboard in maximum 80 mm aperture finished flush on both sides	-/60/60	WF FAS 190335 Table 54 Page 86
HVAC bundle*~	Up to 16 mm × 10 mm insulated copper with 13 mm thick rubber foam lagging Up to 2.5 mm² 2C+E TPS power cable, Up to 1.5 mm² 2C data cable. Up to 20 mm uPVC conduit	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	Up to 16 mm × 10 mm insulated copper with 13 mm thick rubber foam lagging Up to 1.5 mm² 6 core electric cable.	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	
HVAC bundle*~	Up to 3 x 20 mm insulated copper with 13 mm thick Armaflex foamed nitrile rubber lagging Up to 2.5 mm² 2C+E TPS power cable, Up to 1.5 mm² 2C data cable.	Sealed 25 mm deep in maximum 125 mm aperture with additional 25 mm × 25 mm fillet both sides	-/120/120	

Table 14. Minimum 150mm Thick Concrete / AAC Floors

Service type	Service details	System details	FRL – With 600 mm P40-MAK Wrap	FRL – Without P40-MAK Wrap	Ref.
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 **HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25 ^Non fire rated lagging can be substituted for fire rated lagging. Ref Clause FAS190335 4.1.26					
Power cable bundle*	Aperture 500 mm wide × 130 mm high incorporating a 500 mm wide steel cable tray supporting the following cables: • A1 - Bundle of up to 10 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 10 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 10 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm • B - Bundle of up to 2 × 1C × 1.5 mm² PVC/PVC cables – Ø18 mm – Ø21 mm • C1 - 4C × 95 mm² PVC/PVC cable – Ø40 mm – Ø47 mm • C2 - 4C × 95 mm² EPR/PO cable – Ø48.4 mm – Ø61 mm • C3 - 4C × 95 mm² XLPE/EVA cable – Ø42 mm	HPE 25 mm deep to both faces, with a 300 mm 'coatback' of FireMastic 300 along the cables to the top side of the system.	-/120/120	-/120/60	WF FAS 190335 Table 41 Page 72
Power cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • C1 - 4C × 95 mm² PVC/PVC cable – Ø40 mm – Ø47 mm • C2 - 4C × 95 mm² EPR/PO cable – Ø48.4 mm – Ø61 mm • C3 - 4C × 95 mm² XLPE/EVA cable – Ø42 mm	25 mm deep finished flush with the upper face of the floor, including a 100 mm deep infill of friction fitted stonewool insulation.	-/180/120	-/180/30	WF FAS 190335 Table 41 Page 72
Power cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • D1 - 4C × 185 mm² PVC/PVC cable – Ø52 mm • D2 - 4C × 185 mm² EPR/PO cable – Ø64 mm – Ø80 mm • D3 - 4C × 185 mm² XLPE/EVA cable – Ø58 mm		-/120/120	-/120/30	WF FAS 190335 Table 41 Page 72
Power cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • A1 - Bundle of up to 10 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 10 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 10 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm		-/180/120	-/180/30	
Data cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • F – 20 × 2 (20 pair) × 0.6 mm²		-/240/120	-/240/45	
Power cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • G1 - 1C × 95 mm² non-sheathed PVC/- cable – Ø14.1 mm – Ø17.1 mm		-/180/120	-/180/-	

	• G2 - 1C × 185 mm² non-sheathed PVC/- cable – Ø19.3 mm – Ø23.3 mm				
Power cable bundle*	Aperture 50 mm wide × 50 mm high incorporating the following cables: • E - 1C × 185 mm² PVC/- cable – Ø23 mm – Ø27 mm		-/240/120	-/240/-	
Power cable bundle* in conduit	60 mm diameter PE pipe filled with the following cables: • A1 - Bundle of up to 3 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 3 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 3 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm • B - 1 × 1C × 1.5 mm² PVC/PVC cables – Ø18 mm – Ø21 mm	25 mm deep finished flush with the upper face of the floor, including a 100 mm deep infill of friction fitted stonewool insulation.	-/120/120	-/120/90	
Cable tray	Aperture 200 mm wide × 200 mm high incorporating a perforated cable tray		-/120/120	-/120/30	

Table 15. Minimum 150mm Thick Concrete Floors

Service type	Service details	System details	FRL	Ref.
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 **HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25 ^Non fire rated lagging can be substituted for fire rated lagging. Ref Clause FAS190335 4.1.26				
Power cable bundle*	Up to 6 × 2.5 mm² TPS cable in maximum 30 mm aperture	25 mm deep – Both sides with backing rod finished flush.	-/240/240	WF FAS 190335 Table 41 Page 74
Power cable bundle*	50 mm aperture incorporating the following cables: • Up to 4 x RG6 Coax cables • Up to 4 x CAT6 cables • Up to 2 x Fire alarm cables • Security cable	25 mm deep – Both sides with backing rod finished flush.	-/240/240	
PEX-Xa pipe	Up to 20 mm	25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 40 mm aperture	-/240/240	WF FAS 190335 Table 27 Page 56
PEX/AL/PEX pipe	Up to 20 mm	25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 40 mm aperture	-/240/240	
PVC pipe	40 mm x 2 mm wall thickness	25 mm deep finished flush on both sides, including a 100 mm deep infill of friction fitted stonewool insulation. Maximum 77 mm aperture	-/240/240	
uPVC pipe	Up to 32 mm	25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 50 mm aperture	-/240/240	
PP pipe	50 mm with 2.1 mm wall thickness	25 mm deep finished flush on both sides, including a 100 mm deep infill of friction fitted stonewool insulation.	-/240/240	

HVAC bundle*~	Up to 1 1/8" (28.6 mm) copper pipe with 25 mm thick E-Flex ST lagging – 1.2 mm wall thickness Up to 7/8" (22 mm) copper pipe with 25 mm thick E-Flex ST lagging – 1.6 mm wall thickness Up to DN 18 copper pipe with 19 mm lagging – 1.3 mm wall thickness Up to 20 mm condensation drainpipe – 1.5 mm wall thickness Up to 2.5 mm2 2C+E TPS cable Up to 2.5 mm2 3C+E TPS cable Instrolex control cable	25 mm deep in annular gap in maximum 150 mm aperture, finished flush on both sides.	-/240/120	WF FAS 190335 Table 60 Page 91
HVAC bundle*~	Up to 3/8" × 3/4" Paircoil with 19 mm thick FR lagging – 1.4 mm / 2.8 wall thickness Up to 2.5 mm2 2C+E TPS cable Up to 2.5 mm2 3C+E TPS cable Up to 1 × Cat6 cable Instrolex control cable Up to 20 mm condensation drainpipe – 1.5 mm wall thickness	25 mm deep to backing rods in annular gap in maximum 100 mm aperture, finished flush on both sides.	-/240/240	
Insulated copper pipe	Up to Ø25 mm with 25 mm thick insulation	16 mm deep in 10 mm annular gap with 10 mm × 10 mm fillet to both sides	-/120/120	WF FAS 190335 Table 29 Page 60
Insulated copper pipe	Ø25 mm – Ø100 mm with 25 mm – 50 mm thick insulation	16 mm deep in 10 mm annular gap with 10 mm × 10 mm fillet to both sides	-/120/90	
Insulated copper pipe	Up to Ø100 mm with 50 mm thick insulation	16 mm deep in 10 mm annular gap with 10 mm × 10 mm fillet to both sides	-/120/90	
Insulated copper pipe	Ø100 mm – Ø200 mm with 32 mm thick insulation	25 mm deep in 20 mm annular gap on top side only, finished flush, backed with stonewool insulation	-/60/30	

Table 16. Minimum 150mm Thick AAC Floors

Service type	Service details	System details	FRL	Ref.
PEX pipe	Up to 40 mm with maximum 4mm wall thickness	25 mm deep both sides, finished flush	-/120/120	WF FAS 190335 Table 25 Page 53
	110 mm with 10 mm wall thickness	25 mm deep both sides, finished flush	-/120/60	
PVC pipe	Up to 125 mm with maximum 7.6 mm wall thickness	25 mm deep finished flush on both sides, including a 100 mm deep infill of friction fitted stonewool insulation.	-/120/120	
	114 mm with 3.6 mm wall thickness	25 mm deep finished flush on both sides, including a 100 mm deep infill of friction fitted stonewool insulation.	-/90/30	
	114 mm with 8.1 mm wall thickness	25 mm deep finished flush on both sides, including a 100 mm deep infill of friction fitted stonewool insulation.	-/120/30	
	50 mm with 2.4 mm wall thickness	25mm 25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 90 mm aperture	-/120/120	
	50 mm with 3.7 mm wall thickness	25mm 25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 90 mm aperture	-/120/120	
	125 mm with 4.8 mm wall thickness	25mm 25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 165 mm aperture	-/120/90	
	125 mm with 7.4 mm wall thickness	25mm 25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 165 mm aperture	-/120/120	

Table 17. Bondek / Comflor Slabs less than 150mm thick with BOSS Batt thickening

Service type	Service details	System details	FRL – With 600 mm P40-MAK Wrap	FRL – Without P40-MAK Wrap	Ref.
Bondek & Comflor slabs – Ref Clause FAS190335 – 4.1.9					
VARIATIONS *Cables remain valid if the diameter of a single cable is reduced and/or the number of cables is reduced provided the overall outside diameter is not greater than tested. Ref Clause FAS190335 - 4.1.17 ~HVAC bundles represent the maximum number of services. Services are allowed to be removed from the bundle provided the annular gap, depth &/or fillet are maintained. Ref Clause FAS190335 4.1.25 ^Non fire rated lagging can be substituted for fire rated lagging. Ref Clause FAS190335 4.1.26					
Power cable bundle*	Aperture 500 mm wide × 130 mm high incorporating a 500 mm wide steel cable tray supporting the following cables: • A1 - Bundle of up to 10 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 10 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 10 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm • B - Bundle of up to 2 × 1C × 1.5 mm² PVC/PVC cables – Ø18 mm – Ø21 mm • C1 - 4C × 95 mm² PVC/PVC cable – Ø40 mm – Ø47 mm • C2 - 4C × 95 mm² EPR/PO cable – Ø48.4 mm – Ø61 mm • C3 - 4C × 95 mm² XLPE/EVA cable – Ø42 mm	HPE 25 mm deep to both faces, with a 300 mm 'coatback' of FireMastic 300 along the cables to the top side of the system.	-/120/120	-/120/60	WF FAS 190335 Table 41 Page 72
Power cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • C1 - 4C × 95 mm² PVC/PVC cable – Ø40 mm – Ø47 mm • C2 - 4C × 95 mm² EPR/PO cable – Ø48.4 mm – Ø61 mm • C3 - 4C × 95 mm² XLPE/EVA cable – Ø42 mm	25 mm deep finished flush with the upper face of the floor, including a 100 mm deep infill of friction fitted stonewool insulation.	-/180/120	-/180/30	
Power cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • D1 - 4C × 185 mm² PVC/PVC cable – Ø52 mm • D2 - 4C × 185 mm² EPR/PO cable – Ø64 mm – Ø80 mm • D3 - 4C × 185 mm² XLPE/EVA cable – Ø58 mm		-/120/120	-/120/30	
Power cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • A1 - Bundle of up to 10 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 10 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 10 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm		-/180/120	-/180/30	
Data cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • F – 20 × 2 (20 pair) × 0.6 mm²		-/240/120	-/240/45	

Power cable bundle*	Aperture 200 mm wide × 200 mm high incorporating the following cables: • G1 - 1C × 95 mm² non-sheathed PVC/- cable – Ø14.1 mm – Ø17.1 mm • G2 - 1C × 185 mm² non-sheathed PVC/- cable – Ø19.3 mm – Ø23.3 mm		-/180/120	-/180/-	
Power cable bundle*	Aperture 50 mm wide × 50 mm high incorporating the following cables: • E - 1C × 185 mm² PVC/- cable – Ø23 mm – Ø27 mm		-/240/120	-/240/-	
Power cable bundle in conduit*	60 mm diameter PE pipe filled with the following cables: • A1 - Bundle of up to 3 × 5C × 1.5 mm² PVC/PVC cables – Ø14 mm • A2 - Bundle of up to 3 × 5C × 1.5 mm² EPR/PO cables – Ø11.2 mm – Ø14.4mm • A3 - Bundle of up to 3 × 5C × 1.5 mm² XLPE/EVA cables – Ø13 mm • B - 1 × 1C × 1.5 mm² PVC/PVC cables – Ø18 mm – Ø21 mm	25 mm deep finished flush with the upper face of the floor, including a 100 mm deep infill of friction fitted stonewool insulation.	-/120/120	-/120/90	WF FAS 190335 Table 41 Page 72
Cable tray	Aperture 200 mm wide × 200 mm high incorporating a perforated cable tray		-/120/120	-/120/30	
Power cable bundle*	Up to 6 × 2.5 mm² TPS cable in maximum 30 mm aperture	25 mm deep – Both sides with backing rod finished flush.	-/240/240		WF FAS 190335 Table 41 Page 74
Power cable bundle*	50 mm aperture incorporating the following cables: • Up to 4 x RG6 Coax cables • Up to 4 x CAT6 cables • Up to 2 x Fire alarm cables • Security cable	25 mm deep – Both sides with backing rod finished flush.	-/240/240		
PEX-Xa pipe	Up to 20 mm	25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 40 mm aperture	-/240/240		WF FAS 190335 Table 27 Page 56
PEX/AL/PEX pipe	Up to 20 mm	25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 40 mm aperture	-/240/240		
PVC pipe	40 mm x 2 mm wall thickness	25 mm deep finished flush on both sides, including a 100 mm deep infill of friction fitted stonewool insulation. Maximum 77 mm aperture	-/240/240		
uPVC pipe	Up to 32 mm	25 mm deep finish flush both sides, sealant was supported by 10 mm PE backing rod maximum 50 mm aperture	-/240/240		
PP pipe	50 mm with 2.1 mm wall thickness	25 mm deep finished flush on both sides, including a 100 mm deep infill of friction fitted stonewool insulation.	-/240/240		
HVAC bundle*~	Up to 1 1/8" (28.6 mm) copper pipe with 25 mm thick E-Flex ST lagging – 1.2 mm wall thickness Up to 7/8" (22 mm) copper pipe with 25 mm thick E-Flex ST lagging – 1.6 mm wall thickness Up to DN 18 copper pipe with 19 mm lagging – 1.3 mm wall thickness	25 mm deep in annular gap in maximum 150 mm aperture, finished flush on both sides.	-/240/120		WF FAS 190335 Table 60 Page 91

	Up to 20 mm condensation drainpipe – 1.5 mm wall thickness Up to 2.5 mm2 2C+E TPS cable Up to 2.5 mm2 3C+E TPS cable Instrolex control cable			
HVAC bundle*~	Up to 3/8" × 3/4" Paircoil with 19 mm thick FR lagging – 1.4 mm / 2.8 wall thickness Up to 2.5 mm2 2C+E TPS cable Up to 2.5 mm2 3C+E TPS cable Up to 1 × Cat6 cable Instrolex control cable Up to 20 mm condensation drainpipe – 1.5 mm wall thickness	25 mm deep to backing rods in annular gap in maximum 100 mm aperture, finished flush on both sides.	-/240/240	WF FAS 190335 Table 60 Page 91
Insulated copper pipe	Up to Ø25 mm with 25 mm thick insulation	16 mm deep in 10 mm annular gap with 10 mm × 10 mm fillet to both sides	-/120/120	WF FAS 190335 Table 29 Page 60
Insulated copper pipe	Ø25 mm – Ø100 mm with 25 mm – 50 mm thick insulation	16 mm deep in 10 mm annular gap with 10 mm × 10 mm fillet to both sides	-/120/90	
Insulated copper pipe	Up to Ø100 mm with 50 mm thick insulation	16 mm deep in 10 mm annular gap with 10 mm × 10 mm fillet to both sides	-/120/90	
Insulated copper pipe	Ø100 mm – Ø200 mm with 32 mm thick insulation	25 mm deep in 20 mm annular gap on top side only, finished flush, backed with stonewool insulation	-/60/30	

Health and Safety

To learn more about the safe handling of BOSS fire products, refer to the relevant products Safety Data Sheet available at bossfire.com.au.

Limitation

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