



FOR FIRESTOP PIPES UP TO  
LARGE DIAMETERS

# ArmaProtect FC2

## Firestop collar

Firestop collar for fire seals in walls and floors

// For sealing of combustible pipes without insulation up to 400 mm diameter

[www.armacell.com](http://www.armacell.com)



 **armacell**<sup>®</sup>  
ArmaProtect<sup>™</sup>

# ENHANCING SAFETY LEVELS TO PROTECT PROPERTY AND SAVE LIVES.

PASSIVE FIRE PROTECTION (PFP) products and systems are designed to provide fire-safe circumstances in the event of a fire emergency. Often built as part of the building component, PFP measures are not visible to building users and hence often overlooked as a fire protection measure.



PFP systems include:

## // Building construction

- Fire protection to the load bearing structure
- The building envelope, e.g. fire rated external walls, curtain walls etc.

## // Building services

- Firefighting shafts and stairwells
- Fire rated service ducts and shafts
- Fire rated cable coatings
- Fire rated elevators for emergency use only

## // Ventilation systems

- Fire rated ductwork including fire dampers
- Fire rated air transfer grilles (mechanical or intumescent)

## // Compartmentation

- Partitions and floors
- Fire rated doors
- Service shafts
- Suspended ceilings
- Fire rated glazing
- Fire shutters
- Industrial fire shutters and curtains
- Cavity barriers
- Linear gap seals
- Penetration seals for pipes, cables and other services, also known as firestop systems

## COMPARTMENTATION

Regulated by building codes in many countries, buildings are sub-divided into "fire compartments" and in some cases also smoke compartments. In the event of a fire emergency in a building, the strategy is to keep the fire and smoke contained within a limited area of the building (the fire compartment) for a given amount of time (referred to as the fire rating). Fire ratings are country-dependent and typically ranges between 30 and 120 minutes (partly even up to 240 minutes).

Properly designed and installed, PFP systems complement fire compartments to provide multiple levels of fire safety, such as

- Providing building users sufficient time to safely make their way to a means of egress and escape from the building
- Keeping escape routes free from smoke and other toxic gasses, and
- Allowing emergency responders to safely rescue building users from the fire scene and attempt to extinguish the fire

Fire and flames cause severe harm but a key concern for humans is the inhalation of smoke and other toxic gasses. For example, if there is a hole



Compartmentation contributes to a holistic fire safety strategy, and firestop systems is an integral measure to be considered.

as small as 10 mm (0.4") in diameter penetrating a fire rated floor or ceiling between the two rooms and a fire is to occur in a room, it would take less than 3 minutes for the adjacent room to be filled with smoke. In this situation, you would not be able to see your own hand even if placed just 45 cm (18") in front of you. Incapacitation and physical impairment due to smoke inhalation occurs even faster.

Apart from being a safety issue for humans, smoke can also cause severe damage to assets and equipment, for example in hospitals and data centres.



BUILDINGS ARE EQUIPPED WITH MECHANICAL AND ELECTRICAL SYSTEMS TO PROVIDE COMFORT, SAFETY AND SECURITY. SERVICES CONNECTED TO THESE APPLIANCES RUN ACROSS BUILDINGS AND PENETRATE FIRE RATED WALLS, FLOORS AND SERVICE SHAFTS, COMPROMISING THE FIRE COMPARTMENTATION STRATEGY.

Firestop systems are designed to seal penetrations of such services, including:

- Insulated and non-insulated combustible pipes
- Insulated and non-insulated non-combustible pipes
- Single cables and cable bundles
- Cable trays

These systems should be tested according to local governing fire standards and installed in line with the details shown in the fire test report.

At Armacell, safety comes first and maximum reliability is essential. As a systems solutions provider, we know firestop system requirements and standards and offer global support. This table provides an indicative overview of fire test standards for firestop systems globally.

Standard	Description	Geographic coverage
EN 1366-3	Penetration seals	Europe
EN 1366-4	Linear joints	Europe
EN 13501-2	Fire classification of construction products and building elements	Europe
ISO 834	Fire resistance tests	Europe
UL 263	Fire tests of building construction and materials	Asia, Middle East, USA
UL 1479	Fire test of through-penetration firestops	Asia, Middle East, USA
UL 2079	Tests for fire resistance of building joint systems	Asia, Middle East, USA
ASTM E814-13	Standard test method for fire tests of penetration firestop systems	Asia, Middle East, USA



## EUROPEAN STANDARDS

The European Standards applicable to firestop systems are EN1366-3, EN1366-4 and EN13501-2. Fire rating is measured as EI (integrity and insulation) for a specific time duration, and written as EI 60, EI 90, EI 120, EI 180 or EI 240.

- E rating (integrity, "E" from French "Étanchéité"): This is the ability of a test component to stop fire

from spreading to an unexposed side as a result of penetration of flames or smoke.

- I rating (insulation, "I" from French "Isolation"): This is the ability of a test component to restrict the temperature rise of the non-heated side to below specified levels during the fire, which is not more than +140 °C and up to +180 °C.

## UL 1479 FOR THROUGH-PENETRATION FIRESTOPS

This method exposes test samples of penetration firestops to a fire for a standard period of time and temperature and to an application of a hose stream. Ratings are then established based on the length of time the firestop is able to resist before the first development of through-openings or flaming on the unexposed surface, the acceptable limitation of thermal transmission and acceptable performance under the application of the hose stream test.

Two ratings are established for each penetration firestop system:

- F rating (F = fire): based upon flame occurrence on the unexposed side of the test sample and acceptable hose stream performance
- T rating (T = temperature) based on temperature rise and flame occurrence on the unexposed side of the test sample and acceptable hose stream performance.

## UL 2079 FOR FIRE RESISTANCE OF BUILDING JOINT SYSTEMS

These tests are applicable to joint systems of various materials and construction intended for use in linear openings between adjacent fire resistive structures. The fire endurance ratings for joint systems are intended to register performance during the period of fire exposure and are not intended to be interpreted as having determined the acceptability of the joint systems for use before or after fire exposure.

The intent of these methods is to develop data to assist others in determining the suitability of the joint systems where fire resistance is required. These requirements are intended to evaluate the length of time that the types of joint systems specified will contain a fire during a predetermined test exposure. The test evaluates the joint system's resistance to heat and, in some instances, to a hose stream, while carrying an applied load if the assembly is load bearing.

# ARMAPROTECT FIRESTOP SOLUTIONS

ArmaProtect firestop systems:

- are easy to install and highly reliable.
- have been globally tested.
- are certified in numerous combinations and configurations, making the range a “one-stop-shop” solution
- are easy to inspect and to maintain.

Large,  
global  
approved  
range

Excellent  
fire  
performance



**ArmaProtect CM**  
Firestop mortar

Firestop mortar for mixed fire seals in walls and floors

- Blank openings
- Mixed and multiple services
- Cables, cable bundles and cable trays
- Conduit and conduit bundles
- Non-combustible and combustible pipes



**ArmaProtect CB**  
Coated fireboard system with  
ArmaProtect ABLC Firestop  
coating and ArmaProtect ABLF  
Firestop filler mastic

Ablative coated board system for mixed fire seals in walls and floors

- Blank openings
- Mixed and multiple services
- Cables, cable bundles and cable trays
- Conduit and conduit bundles
- Non-combustible and combustible pipes



**ArmaProtect CU**  
Firestop cushion

Firestop cushions for wall and floor openings

- Temporary or permanent sealing
- Cables and cable trays



**ArmaProtect CT**  
Firestop cable tube

Cable tube for fire seals in walls and floors

- Blank openings
- Cables and cable bundles
- Conduit and conduit bundles
- Combustible pipes
- HVAC split-line combinations
- Ideally for retrofitting applications



**ArmaProtect EXPS**  
Firestop sealant

Intumescent firestop sealant for mixed fire seals in walls and floors

- Blank openings
- Cables and cable bundles
- Conduit and conduit bundles
- Non-combustible and combustible pipes



**ArmaProtect FW1**  
Firestop wrap

Firestop wrap for fire seals in walls and floors

- Cable bundles up to Ø150mm
- Combustible pipes up to Ø160mm



**ArmaProtect FW2**  
Firestop wrap

Firestop wrap for fire seals in walls and floors

- Non-combustible pipes up to Ø323.9mm with combustible insulation
- Composite pipes
- Conduits and conduit bundles



**ArmaProtect FW3**  
Firestop wrap

Firestop wrap for fire seals in walls and floors

- Combustible pipes Ø≤160mm (without combustible insulation)
- Combustible pipes Ø≤110mm (with combustible insulation)
- Multi-layer composite pipes Ø≤110mm



**ArmaProtect FC1 and FC2**  
Firestop collar

Firestop collar for fire seals in walls and floors

For sealing of combustible pipes without insulation up to Ø160 mm (FC1) and Ø400 mm (FC2), respectively











**ArmaProtect EFC1 and EFC2**  
Endless firestop collar

Endless firestop collar for fire seals in walls and floors








- Combustible pipes Ø≤ 160 mm (with and without sound insulation)
- Non-combustible pipes Ø≤ 108 mm (with combustible insulation)
- Multi-layer composite pipes Ø≤ 110 mm<sup>1</sup>

SOLUTIONS WITH EN TESTING (ETA)

// For small to large openings  
See relevant ETA for further installation details.

	SMALL	MEDIUM	LARGE
EXCEPTIONAL SOLUTION 	<div>ArmaProtect CT</div> <ul style="list-style-type: none"><li>Pre-installed device</li><li>Clean installation</li><li>Easy re-penetration</li><li>Openings up to Ø116mm</li><li>Up to EI 120</li></ul> 	<div>ArmaProtect CB</div> <ul style="list-style-type: none"><li>Easy re-penetration and maintenance</li><li>Cable, pipe, mixed and multiple penetrations</li><li>Up to EI 240</li><li>Openings up to 1.4m x 2.0m or 1.2m x 2.4m, respectively</li></ul> 	
SUPERIOR SOLUTION 	<div>ArmaProtect EXPS</div> <ul style="list-style-type: none"><li>Up to EI 120</li><li>Openings up to Ø150mm</li></ul>  <div>ArmaProtect ABLF</div> <ul style="list-style-type: none"><li>Up to EI 90</li><li>Openings up to Ø160mm</li></ul> 		
STANDARD SOLUTION 		<div>ArmaProtect CM</div> <ul style="list-style-type: none"><li>Cable, pipe, mixed and multiple penetrations</li><li>Up to EI 240</li><li>Openings up to 1.2m x 2.0m</li></ul> 	

// For pipe penetrations  
See relevant ETA for further installation details.




	SMALL TO MEDIUM PIPE DIAMETER	LARGE PIPE DIAMETER
EXCEPTIONAL SOLUTION 	<div>ArmaProtect EFC1 and EFC2</div> <ul style="list-style-type: none"><li>Flexible and clean installation</li><li>Problem solver for special applications on job site</li><li>Combustible pipes Ø≤ 160 mm (with and without sound insulation)</li><li>Non-combustible pipes Ø≤ 108 mm (with combustible insulation)</li><li>Multi-layer composite pipes Ø≤ 110 mm</li><li>Up to EI 240</li></ul> 	<div>ArmaProtect FC2</div> <ul style="list-style-type: none"><li>Pre-formed product</li><li>Clean installation</li><li>Combustible pipes Ø≤ 400mm (without insulation)</li><li>Up to EI 120</li></ul> 
SUPERIOR SOLUTION 	<div>ArmaProtect FC1</div> <ul style="list-style-type: none"><li>Pre-formed product</li><li>Clean installation</li><li>Combustible pipes Ø≤160mm (without insulation)</li><li>Up to EI 240</li></ul>  <div>ArmaProtect FW3</div> <ul style="list-style-type: none"><li>Flexible and clean installation</li><li>Combustible pipes Ø≤160mm (without combustible insulation)</li><li>Combustible pipes Ø≤110mm (with combustible insulation)</li><li>Multi-layer composite pipes Ø≤110mm</li><li>Up to EI 120</li></ul> 	<div>ArmaProtect FW2</div> <ul style="list-style-type: none"><li>Flexible and clean installation</li><li>Non-combustible pipes up to Ø323.9mm (with combustible insulation)</li><li>Up to EI 120</li></ul> 

SOLUTIONS WITH UL TESTING (ACC. TO UL 1479 / ASTM E814)

// For small to large openings  
See relevant UL systems for further installation details.

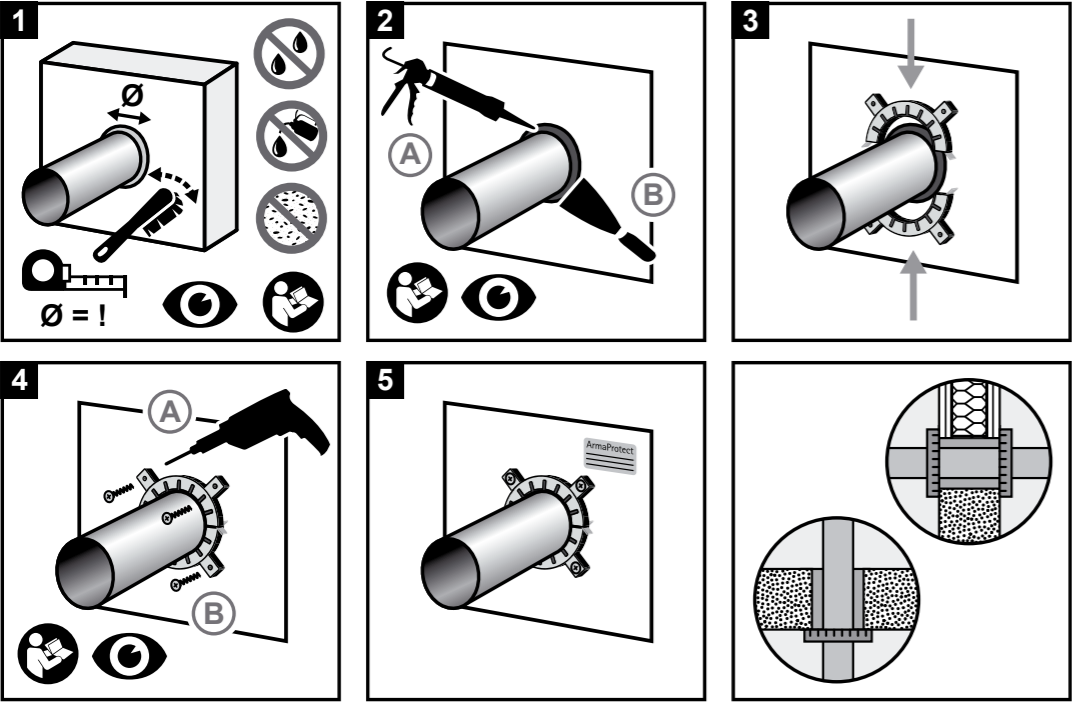
	SMALL	MEDIUM	LARGE
EXCEPTIONAL SOLUTION 	<div>ArmaProtect CT</div> <ul style="list-style-type: none"><li>Pre-installed device</li><li>Clean installation</li><li>Easy re-penetration</li><li>Openings up to Ø116mm</li><li>Up to 3 h F rating</li></ul> 	<div>ArmaProtect CU</div> <ul style="list-style-type: none"><li>Pre-formed product</li><li>Clean installation</li><li>Easy re-penetration</li><li>For temporary and temporary use</li><li>Openings up to 400mm x 200mm</li><li>Up to 3 h F rating</li></ul> 	
SUPERIOR SOLUTION 	<div>ArmaProtect FW1</div> <ul style="list-style-type: none"><li>Flexible and clean installation</li><li>Combustible pipes up to Ø160mm</li><li>Cable bundles up to Ø150mm</li><li>Up to 3 h fire rating</li></ul>  <div>ArmaProtect FW2</div> <ul style="list-style-type: none"><li>Flexible and clean installation</li><li>Non-combustible pipes up to Ø159mm</li><li>Composite pipes</li><li>Conduits and conduit bundles</li><li>Up to 3 h fire rating</li></ul> 	<div>ArmaProtect CB</div> <ul style="list-style-type: none"><li>Easy re-penetration and maintenance</li><li>Also tested for bus bars and ducts</li><li>Up to 3 h F rating</li><li>Openings up to 0.6m x 0.4m</li></ul> 	
STANDARD SOLUTION 		<div>ArmaProtect CM</div> <ul style="list-style-type: none"><li>Up to 3 h F rating</li><li>Openings up to 0.6m x 0.4m</li></ul> 	

// For pipe penetrations  
See relevant UL systems for further installation details.

	COMBUSTIBLE PIPES	NON-COMBUSTIBLE PIPES
SUPERIOR SOLUTION 	<div>ArmaProtect FW1</div> <ul style="list-style-type: none"><li>Flexible and clean installation</li><li>Combustible pipes up to Ø160mm</li><li>Also tested for cable bundles up to Ø150mm</li><li>Up to 3 h fire rating</li></ul> 	<div>ArmaProtect FW2</div> <ul style="list-style-type: none"><li>Flexible and clean installation</li><li>Non-combustible pipes up to Ø159mm</li><li>PE/AL/PE composite pipe up to Ø63mm</li><li>Also tested for PE-HD conduits up to Ø100mm (conduits Ø≤ 32mm), PE-HD conduits up to Ø50mm with speed pipe bundles and clima split bundles</li><li>Up to 3 h fire rating</li></ul> 

INSTRUCTIONS FOR USE

Ensure that surfaces are dry and free of dust and grease.



// Consumption guide

Choose ArmaProtect FC2 Firestop collar based on the pipe diameter.  
Standard pipe application:

- 2 firestop collars for wall penetration (installation of firestop collar from both sides)
- 1 firestop collar for floor penetration (installation of firestop collar on the bottom side of the floor)

Collar size [Ø] [mm]	D2 (Internal Ø) [mm]	D1 (External Ø) [mm]	H1 (Installation height) [mm]	Number of hooks
32	36	50	26.0	2
40	44	58	26.0	2
50	54	68	26.0	2
63	67	94	26.0	4
75	79	106	26.0	4
90	94	132	26.0	4
110	114	155	26.0	4



Collar size [Ø] [mm]	D2 (Internal Ø) [mm]	D1 (External Ø) [mm]	H1 (Installation height) [mm]	Number of hooks
125	129	172	26.0	4
140	144	200	40.0	6
160	164	220	40.0	6
180	184	264	40.0	8
200	204	284	40.0	8
225	239	328	51.5	10
250	264	353	51.5	10
280	289	378	51.5	12
300	314	403	51.5	12
315	328	417	51.5	12
355	370	459	51.5	12
400	415	504	51.5	12

MAIN APPLICATIONS  
ACC. ETA-22/0060

In drywalls and solid walls <sup>1</sup>	
Base material	Drywall, concrete wall, aerated concrete wall, masonry wall
Base material thickness	≥ 100 mm
Maximum pipe diameter	up to 400 mm pipe diameter
Penetrants	up to EI 120-U/U <sup>1</sup>
• Combustible pipe without insulation (≤ 400 mm) <sup>1</sup>	

<sup>1</sup> See ETA 22/0060 for further installation details.

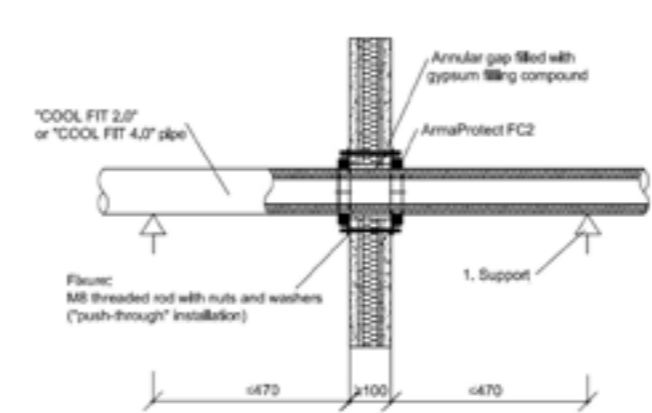
Concrete floors <sup>1</sup>	
Base material	Concrete floors
Base material thickness	≥ 150 mm (wall)
Maximum pipe diameter	up to 400 mm pipe diameter
Penetrants	up to EI 120-U/U <sup>1</sup>
• Combustible pipe without insulation (≤ 400 mm) <sup>1</sup>	

<sup>1</sup> See ETA 22/0060 for further installation details.



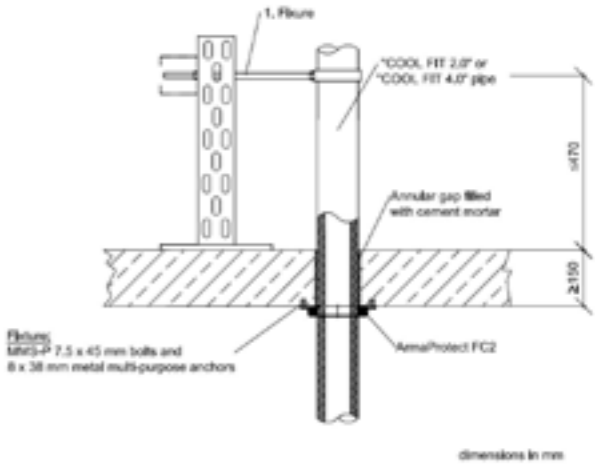
// Typical ETA approved systems<sup>1</sup>

Wall application



<sup>1</sup> See ETA 22/0060 for further installation details.

Floor application



TECHNICAL DATA - ARMAPROTECT FC2 FIRESTOP COLLAR

Brief description	ArmaProtect FC2 is a solid metal sleeve equipped with several layers of intumescent material to maintain the fire resistance performance of fire penetrations in walls and floors.
Material type	Powder-coated sheet steel housing (Ø up to 200mm) / galvanised sheet steel housing (Ø ≥ 225mm) with flexible intumescent strip.
Product colour range	Housing is grey and inlay is anthracite.
Special features	Easy visual inspection.
Product range	32mm to 400mm diameter.
Applications	Firestop collar for sealing combustible pipes without insulation.
Installation	For professional use only. Refer to third party published listings, national approvals / assessments and Armacell’s product literature for specific application details as well as before handling this product.
Declaration of Performance (DoP)	ArmaProtect FC2

Approvals and compliance

Specification compliance	<ul style="list-style-type: none"><li>ETA 22/0060 acc. EN 1366-3</li></ul>
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Property	Value/Assessment	Standard/Test method
Temperature range		
Operating temperature	-40°C to 70°C (40°F to 158°F)	
Application temperature	5°C to 25°C (41°F to 77°F)	
Storage and transportation temperature	5°C to 30°C (41°F to 77°F)	
Mechanical properties		
Expansion ratio	Inlay: 18 to 38 times	ETA 22/0060
Fire performance		
Reaction to fire	Housing: Class A1 Inlay: Class E	EN 13501-1
Resistance to fire	See Annex	
Health and environment		
Emission of dangerous substances	No dangerous substances.	ETAG 026-02
Other technical features		
Durability and serviceability	Use category type X	EOTA TR 024
Safety information	Please refer to the safety data sheet available on our website.	
Storage	Store in a cool and dry place with an ambient temperature of 5 °C to 25 °C and protect from frost.	

Firestop collar

Item	Description	Content
PRO-FC2-032	ArmaProtect FC2 Firestop collar Ø 32 mm	1 piece(s)
PRO-FC2-040	ArmaProtect FC2 Firestop collar Ø 40 mm	1 piece(s)
PRO-FC2-050	ArmaProtect FC2 Firestop collar Ø 50 mm	1 piece(s)
PRO-FC2-063	ArmaProtect FC2 Firestop collar Ø 63 mm	1 piece(s)
PRO-FC2-075	ArmaProtect FC2 Firestop collar Ø 75 mm	1 piece(s)
PRO-FC2-090	ArmaProtect FC2 Firestop collar Ø 90 mm	1 piece(s)
PRO-FC2-110	ArmaProtect FC2 Firestop collar Ø 110 mm	1 piece(s)
PRO-FC2-125	ArmaProtect FC2 Firestop collar Ø 125 mm	1 piece(s)
PRO-FC2-140	ArmaProtect FC2 Firestop collar Ø 140 mm	1 piece(s)
PRO-FC2-160	ArmaProtect FC2 Firestop collar Ø 160 mm	1 piece(s)
PRO-FC2-180	ArmaProtect FC2 Firestop collar Ø 180 mm	1 piece(s)
PRO-FC2-200	ArmaProtect FC2 Firestop collar Ø 200 mm	1 piece(s)
PRO-FC2-225	ArmaProtect FC2 Firestop collar Ø 225 mm	1 piece(s)
PRO-FC2-250	ArmaProtect FC2 Firestop collar Ø 250 mm	1 piece(s)
PRO-FC2-280	ArmaProtect FC2 Firestop collar Ø 280 mm	1 piece(s)
PRO-FC2-300	ArmaProtect FC2 Firestop collar Ø 300 mm	1 piece(s)
PRO-FC2-315	ArmaProtect FC2 Firestop collar Ø 315 mm	1 piece(s)
PRO-FC2-355	ArmaProtect FC2 Firestop collar Ø 355 mm	1 piece(s)
PRO-FC2-400	ArmaProtect FC2 Firestop collar Ø 400 mm	1 piece(s)

Firestop wrap.

Item	Description	Content
PRO-ID-SET	ArmaProtect ID identification plate set	5 pieces

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# ABOUT ARMACELL

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As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With more than 3,000 employees and 24 production plants in 16 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.



For more information, please visit:  
[www.armacell.com](http://www.armacell.com)