

FOR PIPE PENETRATIONS UP
TO MEDIUM DIAMETERS

ArmaProtect FW3

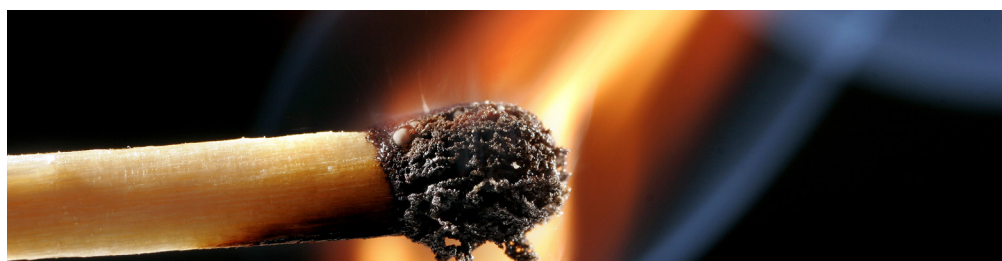
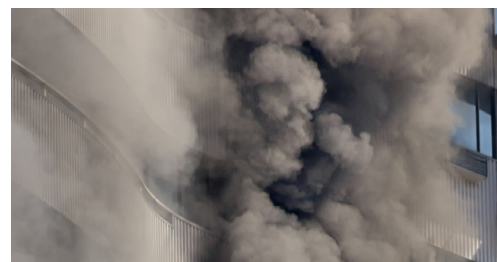
Firestop wrap

Firestop wrap for fire seals in walls and floors

// Combustible pipes $\varnothing \leq 160\text{mm}$ (without combustible insulation)¹

// Combustible pipes $\varnothing \leq 110\text{mm}$ (with combustible insulation)¹

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ArmaProtect[™]

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.

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YOU'RE ALWAYS ON
THE SAFE SIDE.

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 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 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 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 CT Firestop cable tube

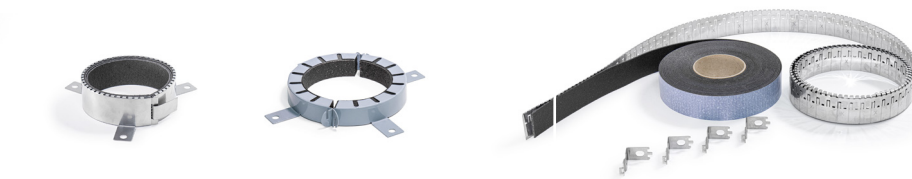
ArmaProtect EXPS Firestop sealant

Cable tube for fire seals in walls and floors

Intumescent firestop sealant for mixed 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

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



ArmaProtect FC1 and FC2 Firestop collar

ArmaProtect EFC1 and EFC2 Endless firestop collar

Firestop collar for fire seals in walls and floors

Endless 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

- Combustible pipes $\varnothing \leq 160$ mm (with and without sound insulation)
- Non-combustible pipes $\varnothing \leq 108$ mm (with combustible insulation)
- Multi-layer composite pipes $\varnothing \leq 110$ mm¹

SOLUTIONS WITH EN TESTING (ETA)



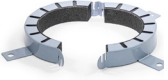




// For small to large openings

See relevant ETA for further installation details.

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

// For pipe penetrations

See relevant ETA for further installation details.

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

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

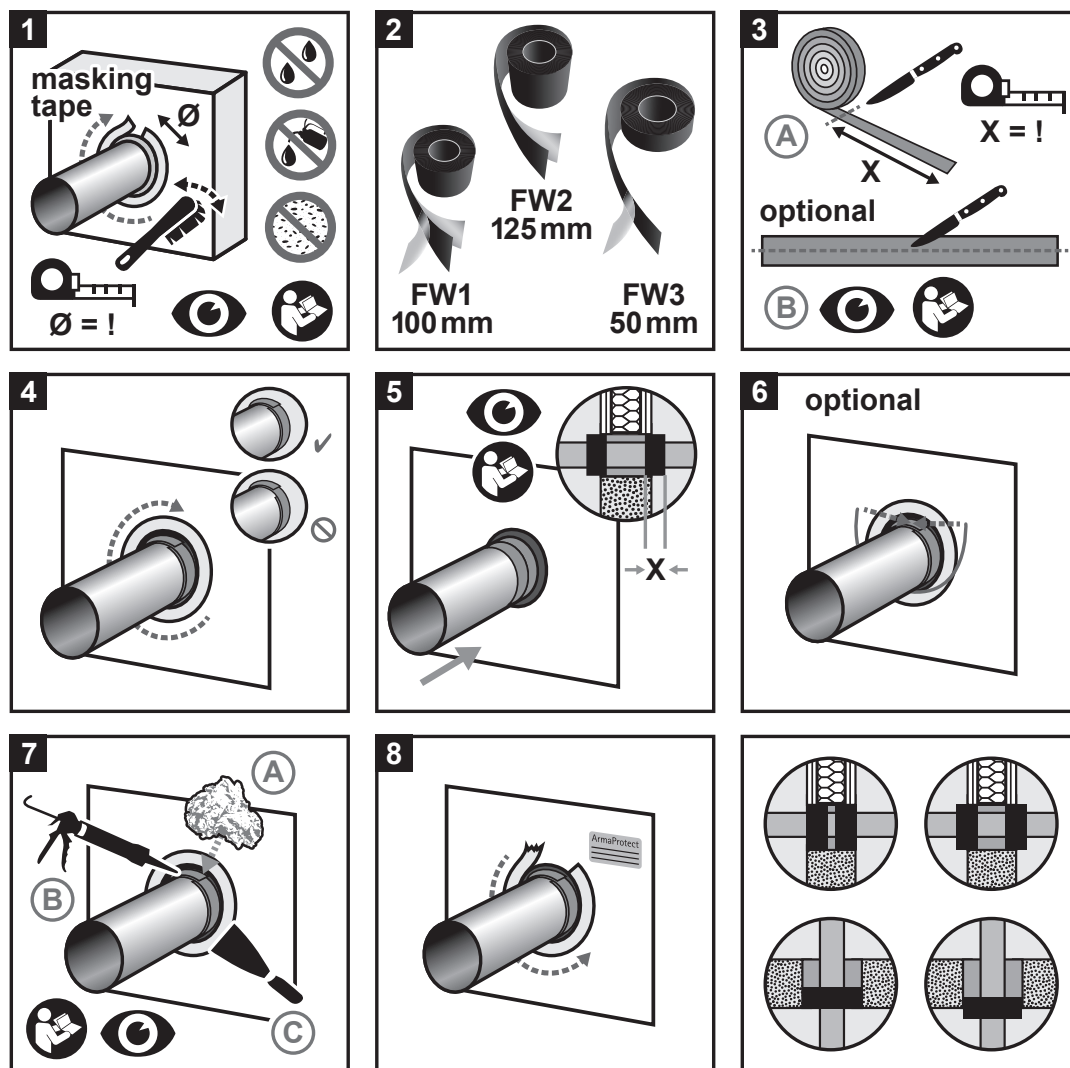
// For pipe penetrations

See relevant UL systems for further installation details.

	COMBUSTIBLE PIPES	NON-COMBUSTIBLE PIPES
SUPERIOR SOLUTION 	ArmaProtect FW1 <ul style="list-style-type: none"> Flexible and clean installation Combustible pipes up to Ø160mm Also tested for cable bundles up to Ø150mm Up to 3 h fire rating 	ArmaProtect FW2 <ul style="list-style-type: none"> Flexible and clean installation Non-combustible pipes up to Ø159mm PE/AL/PE composite pipe up to Ø63mm 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 Up to 3 h fire rating 

INSTRUCTIONS FOR USE

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



// Consumption guide

Check consumption of ArmaProtect Firestop Wrap FW3 based on the pipe diameter and number of layers required. Standard application for pipes:

- for wall penetration: installation of firestop wrap from both sides
- for floor penetration: installation of firestop wrap on the bottom side of the floor.

MAIN APPLICATIONS

ACC. ETA-21/1099



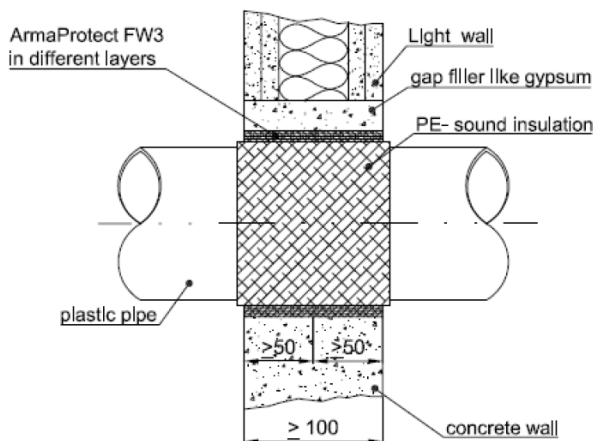
In drywalls, solid walls and concrete floors¹

Base material	Drywall, concrete wall, aerated concrete wall, masonry wall, shaft wall, concrete floor
Base material thickness	≥ 100 mm (wall) ≥ 40 mm (shaft wall) ≥ 150 mm (floor)
Seal thickness	≥ 100 mm (wall) ≥ 80 mm (shaft wall) ≥ 150 mm (floor)
Penetrants	up to EI 120-U/U ¹
<ul style="list-style-type: none"> Combustible pipes $\varnothing \leq 160$ mm (without combustible insulation)¹ Combustible pipes $\varnothing \leq 110$ mm (with combustible insulation)¹ Multi-layer composite pipes $\varnothing \leq 110$ mm¹ 	

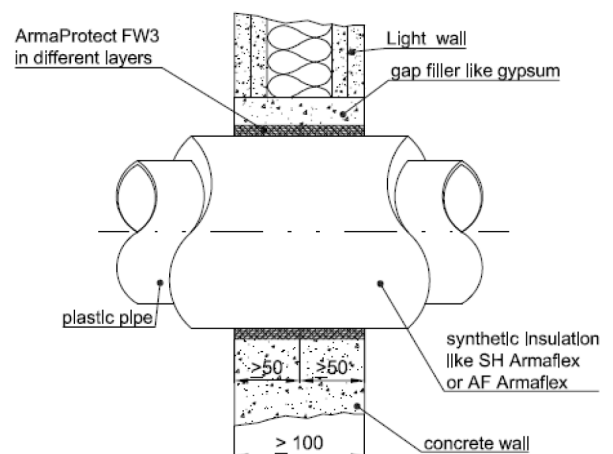
¹ See ETA 21/1099 for further installation details.

// Typical ETA approved systems¹

Wall application with PE-sound insulation

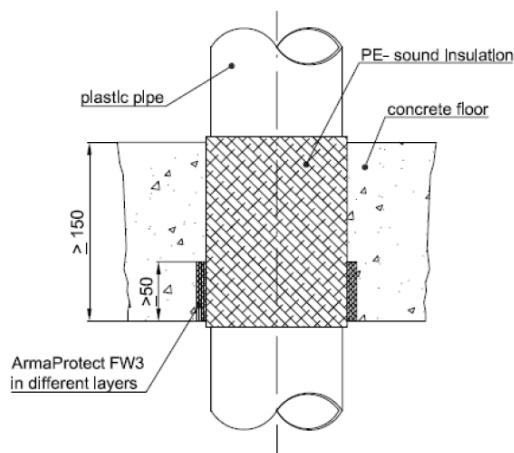


Wall application with synthetic insulation

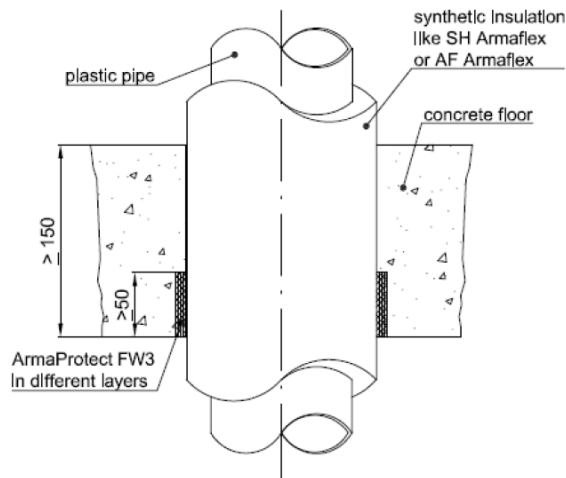


¹ See ETA 21/1099 for further installation details.

Floor application with PE-sound insulation



Floor application with synthetic insulation



¹ See ETA 21/1099 for further installation details.

TECHNICAL DATA - ARMAPROTECT FW3 FIRESTOP WRAP

Brief description	ArmaProtect FW3 is a flexible firestop wrap.
Material type	Halogen-free intumescent material based on blowing graphite technology.
Product colour range	Dark red.
Special features	Easy visual inspection, self-adhesive strip.
Product range	Firestop wrap roll with self-adhesive strip and dimensions of 12.5m x 50mm x 2mm.
Applications	Firestop wrap for fire seals in walls and floors for combustible pipes (with and without insulation) and multi-layer composite pipes.
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 FW3

Approvals and compliance

Specification compliance	• ETA-21/1099 acc. EN 1366-3
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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 25°C [41°F to 77°F]	
Mechanical properties		
Density	1.2 g/cm³ ± 10%	
Expansion ratio	18 to 38 fold	
Fire performance		
Reaction to fire	Class E	EN 13501-1
Resistance to fire	See Annex	
Health and environment		
Emission of dangerous substances	No dangerous substances.	ETA 21/1099
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.	
Shelf life	No shelf life	
Storage	Store in a cool and dry place with an ambient temperature of 5 °C to 25 °C and protect from frost.	

Firestop wrap

Item	Description	Content
PRO-FW3-12.5m	ArmaProtect FW3 Firestop wrap	12.5m

Firestop wrap.

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

All data and technical information are based on results achieved under the specific conditions defined according to the testing standards referenced. Despite taking every precaution to ensure that said data and technical information are up to date, Armacell does not make any representation or warranty, express or implied, as to the accuracy, content or completeness of said data and technical information. Armacell also does not assume any liability towards any person resulting from the use of said data or technical information. Armacell reserves the right to revoke, modify or amend this document at any moment. It is the customer's responsibility to verify if the product is suitable for the intended application. The responsibility for professional and correct installation and compliance with relevant building regulations lies with the customer. This document does not constitute nor is part of a legal offer or contract. By ordering/receiving product you accept the Armacell General Terms and Conditions of Sale applicable in the region.

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ABOUT ARMACELL

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.



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