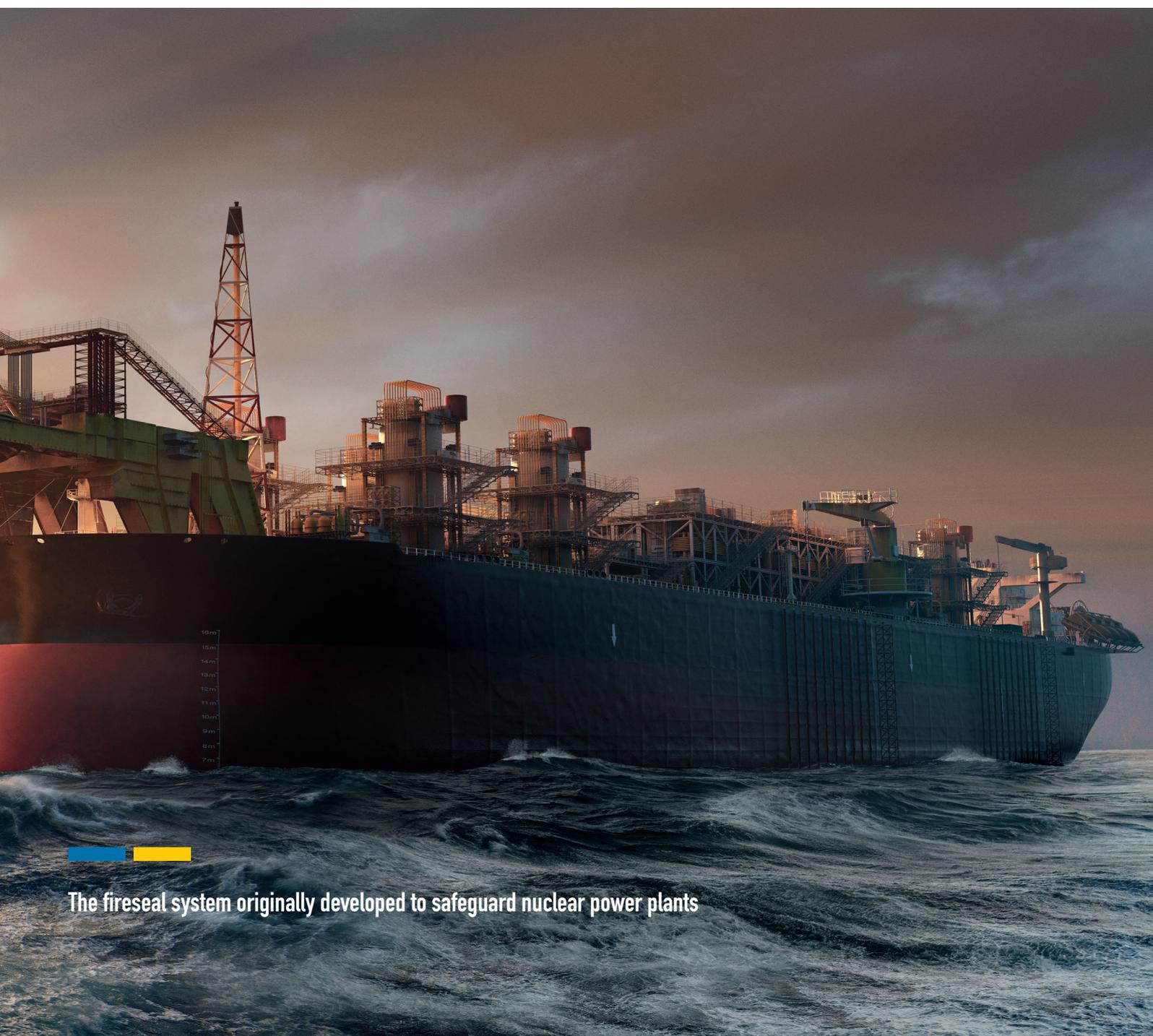




FireSeal

MARINE AND OFFSHORE CATALOGUE



 The fireseal system originally developed to safeguard nuclear power plants



THE EASY WAY TO FIRESEAL

It started with one of the most safety-critical jobs imaginable: An assignment from the Swedish Government to develop a system for fire sealing at Sweden's nuclear power plants. Today, our fire sealing system has been on guard for more than 40 years

wherever fires must never be allowed to spread: offshore platforms, FPSOs, oil tankers as well as navy vessels and container ships. And it has approvals for all of the most common deck and bulkhead applications.

Our system has become a favorite of installers and buyers because of our dedication to making it easy to work with and easy to make safe installations. And when it doesn't take long to do it right, it is also cost effective. That's why FireSeal has an impressive reference list from some of the world's largest shipyards.

Learn more about what the easy way to fireseal can do for safety on vessels, for your comfort on the job, and for long-term cost effectiveness.

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MARINE WRAP

Class A-0 to A-60

Plastic pipes

Quick and easy to install

Fits all dimensions

Single and multiple pipes

MARINE FLEX SYSTEM

Class A-0 to A-60

Class H-0 to H-60

Steel pipes

Two components

Smoke, gas and watertight

Easy to retrofit

Single and multiple pipes

INTUMESCENT SLEEVE

Class A-0 to A-60

Plastic pipes

Smoke, gas & watertight

Single / multiple plastic pipes

Self-tapping screw / tack weld

PIPELOCK

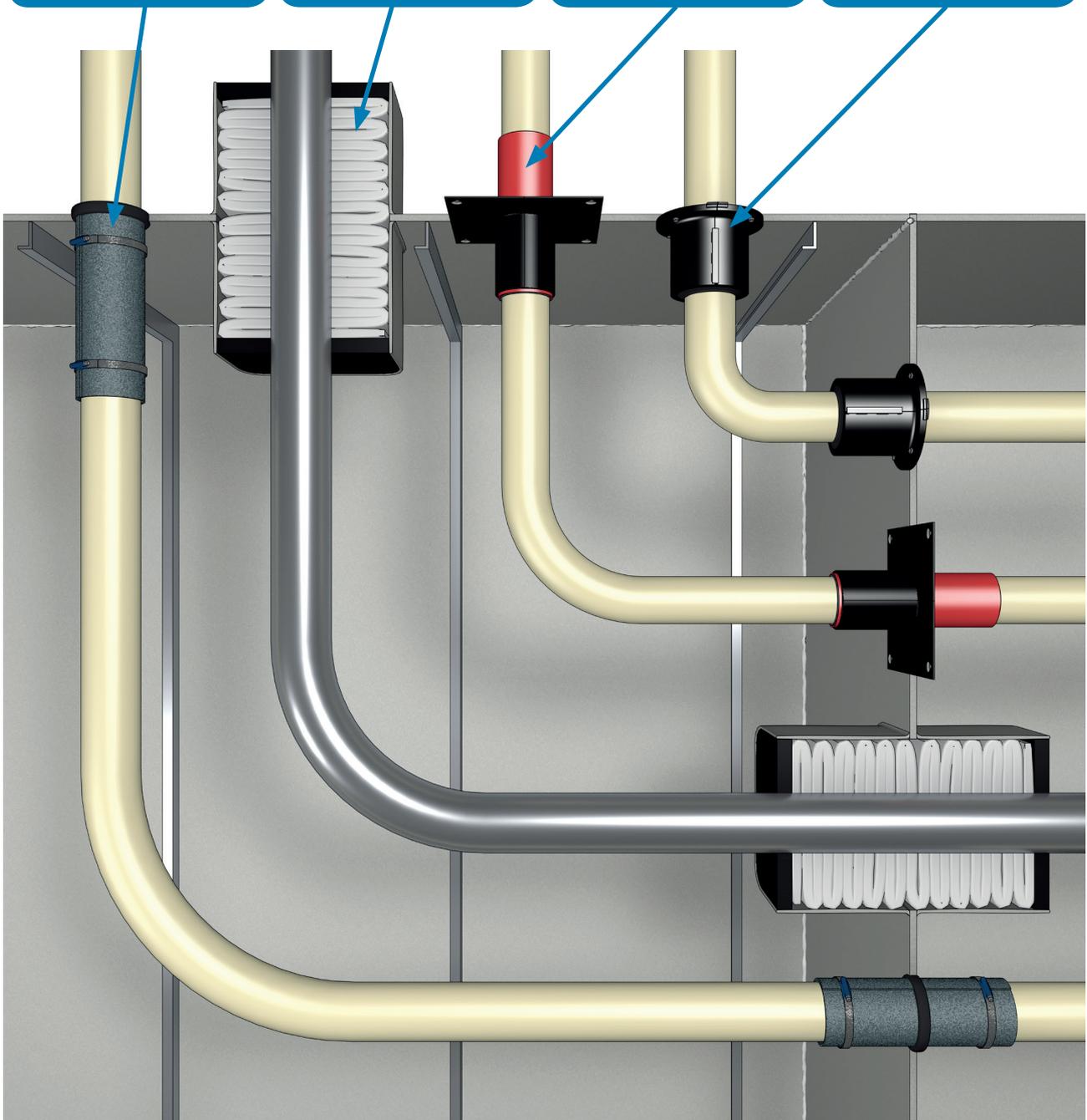
Class A-0 to A-60

Plastic pipes

Smoke, gas & watertight

Single or multiple pipes

Self-tapping screw / tack weld



MARINE MULTI MS

Fire rated MS Polymer

Joint seal

Paintable

Adhesive

Flexible, vibration-resistant seals

INTUMESCENT SLEEVE

Class A-0 to A-60

Cables

Smoke, gas & watertight

Single or multiple cables

Self-tapping screw or tack weld

MARINE FLEX SYSTEM

Class A-0 to A-60

Class H-0 to H-60

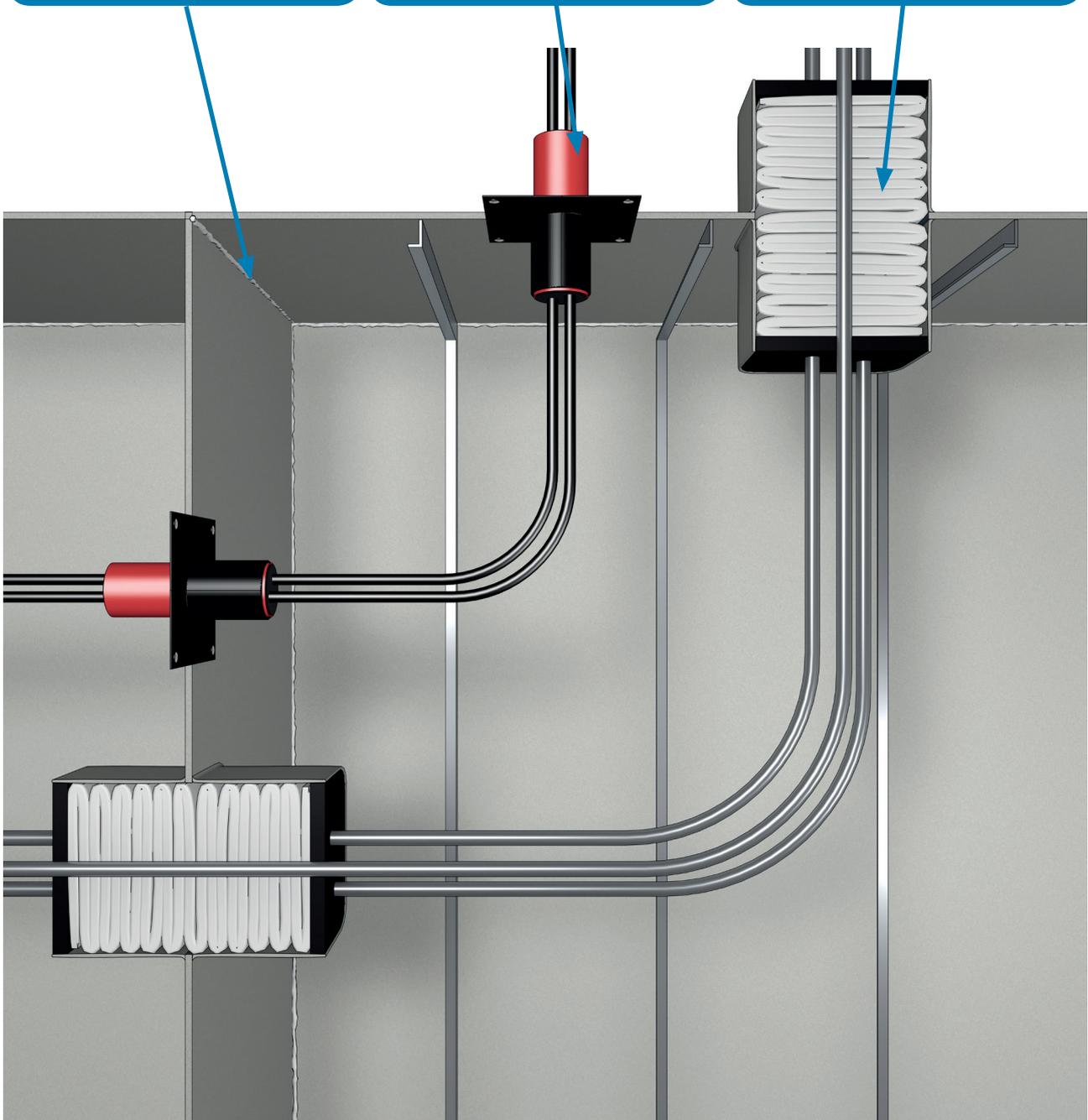
Cables

Two components

Smoke, gas and watertight

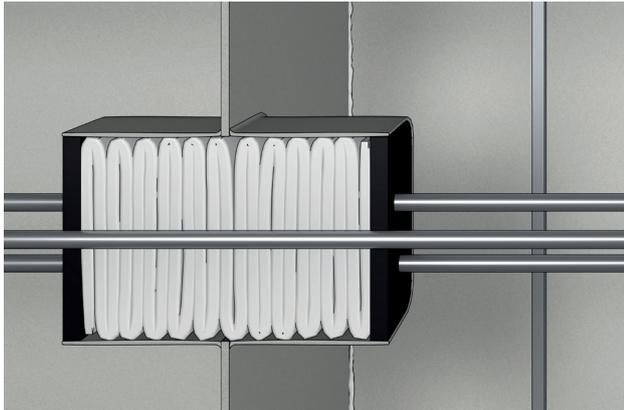
Easy to retrofit

Single and multiple cables



MARINE FLEX SYSTEM

Cable penetrations



Marine Flex System single and multi cable penetration

AREA OF USE

Marine Flex System is a cable penetration seal developed to meet the requirements of IMO 2010 FTP Code Part 3.

The Marine Flex System is intended for use in both deck as well as bulkhead penetrations. Marine Flex System stops spreading of fire, smoke, gas, water, dust and sound. The elasticity and strenght of the sealing material Marine Flex offers a flexible seal that resists large movements and vibrations without deforming or loss of adhesion. Marine Flex System is approved for use below the waterline.

MATERIALS

The system utilizes non-combustible Calcium Silicate Blanket packed in to the penetration between the sleeve and the cables. The external surfaces of the seal are protected by a layer of Marine Flex, a fire resistant silicone which forms a water and gas tight seal. The Marine Flex System is installed with ease and without any special tools.

MAINTENANCE & REPAIRS

Maintenance of the seal is normally not required. Any repairs are made with ease by addition of new Marine Flex.

FS-Flex D



TECHNICAL PROPERTIES

Installed as Marine Flex System

Fire Rating	A0 - A60 H0 - H60
Pressure Resistance	Up-to 2,5 Bar
Gas Tightness	Up-to - 0,6 Bar
Sound Attenuation	Approx. 55 dBA
Thickness of Silicone Sealant	2 x 15 mm
Sleeve Depth (total)	Min.180 mm for A0-A60 Min. 250 mm for H0-H60

Components:

Marine Flex

Colour	Black, white
Density	1400 kg/m ³
Application Temperature	5 - 35°C
Working Temperature	-65°C up-to 250°C
Curing Time (15mm thk)	abt.1 week
Time to apply	20 - 30 minutes
Elongation	1300 %
Hardness	15 Shore A
Tensile Strength	0.7 MPa
Electrical Properties	Insulating
Shelf Life	12 months

Blanket

Colour	Off-white
Density	96 kg/m ³
Working Temperature	1200°C

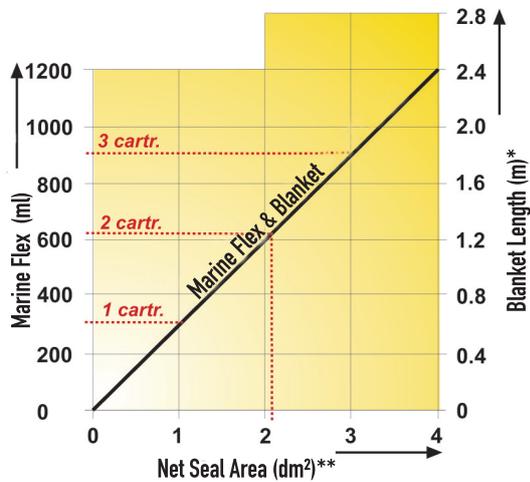
TECHNICAL ASSISTANCE

Contact FireSeal for any further details you may require.

Note:Technical details in this catalog are generic. See each class societies certificate for specifics.

MATERIAL CONSUMPTION (Estimated)

Figure 1:
Materials consumption for A Class Seal



* Blanket 100 mm wide pre-cut strip.

** Net Area = Sleeve cross sectional area less cabl cross sectional area.

Quick Guide - consumption per dm² net seal area:

Marine Flex - 1 cartridge for A and H Class;
Blanket - 9 dm² for A Class and 12 dm² for H Class.

PACKING

Marine Flex System is supplied as:

- Marine Flex, 310 ml cartridge
- Blanket, strip 7300 x 600 x 25 mm. (1 roll)
- Blanket, strip 7300 x 100 x 25 mm. (6 roll)

The components should be stored dry up to 25°C.

SLEEVE DESIGN

The sleeve of 2 mm thickness minimum to be continuously welded or bolted.

The distance between cable and the sleeve should not be less than 5 mm. Bundled cables are approved.

SLEEVE INSULATION

The sleeve should be insulated with non flammable mineral wool according to class requirements.

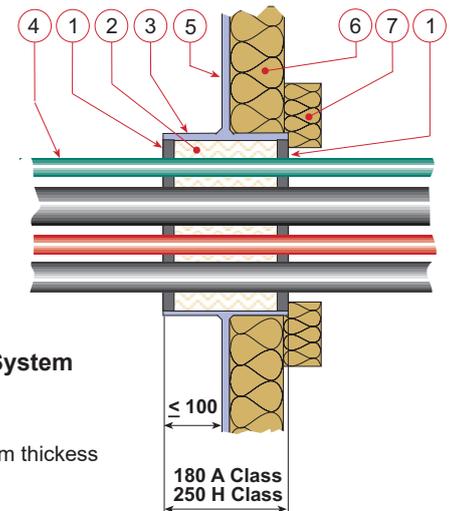


Figure 2:
Typical Marine Flex System penetration.

Key:

- 1 Marine Flex 15mm nom thickness
- 2 Blanket
- 3 Steel sleeve
- 4 Penetrating cables
- 5 Division plate
- 6 Division insulation*
- 7 Approved sleeve insulation*

*Yard supply

INSTALLATION DIRECTIVES

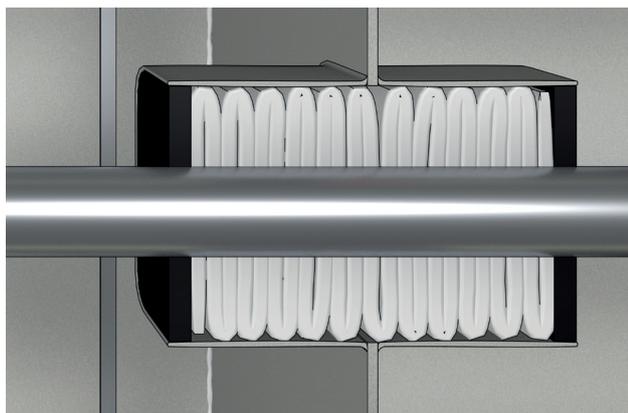
1. Remove all loose debris from the sleeve and make sure the sleeve is free from dust, oil and moisture.
2. Roll or fold the Blanket in suitable sizes, insert to the sleeve. For water and gas tightness cables has to be separated. Do the same on the opposite side. Leave a distance of nominal 15 mm thickness on each side of the sleeve.
3. Apply Marine Flex 15mm on both sides. Make sure it's applied in between the cables.
4. Even out the Marine flex with a sponge wetted with soap water or a spray bottle with soap water and a putty knife.
5. Remove any excess material with a cloth wetted with parafin or white spirit.
6. Insulate according to class requirements.
7. Leave to cure for atleast 24 hours, total curing time appx 5-7 days.

Recommendations for use of our products are based on tests and information we believe to be reliable. Manufacturer or seller are not responsible for results where the products are used under conditions beyond our control. Specifications are subject to change without notice.

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

MARINE FLEX SYSTEM

Metal pipe penetrations



Marine Flex System
Single and Multi Pipe Penetration

AREA OF USE

Marine Flex System is a pipe penetration seal developed to meet the requirements of IMO 2010 FTP Code Part 3.

The Marine Flex System is intended for use in both deck as well as bulkhead penetrations. Marine Flex System stops spreading of fire, smoke, gas, water, dust and sound. The elasticity and strength of the sealing material Marine Flex offers a flexible seal that resists large movements and vibrations without deforming or loss of adhesion. Marine Flex System is approved for use below the waterline. Not intended for areas continuously immersed in water.

MATERIALS

The system utilizes non-combustible Calcium Silicate Blanket packed in to the penetration between the sleeve and the pipes. The external surfaces of the seal are protected by a layer of Marine Flex, a fire resistant silicone which forms a water and gas tight seal. The Marine Flex System is installed with ease and without any special tools.

MAINTENANCE & REPAIRS

Maintenance of the seal is normally not required. Any repairs are made with ease by addition of new Marine Flex.

FS-Flex D



TECHNICAL PROPERTIES

Installed as Marine Flex System:

Fire Rating	A0 - A60 H0 - H60
Pressure Resistance	2,5 Bar
Gas Tightness	0,03 Bar
Sound attenuation	55 dBA
Approved Pipe Diameter	DN300
Thickness of Silicone Sealant	2 x 15 mm
Sleeve Depth (total)	Min. 200 mm A60 Min. 250 mm H60

Components:

Marine Flex

Colour	Black or White
Density	1400 kg/m ³
Application Temperature	5 - 35°C
Working Temperature	-65°C up-to 250°C
Curing Time (15mm thk)	abt. 1 week
Working Time	20 - 30 minutes
Elongation	1300 %
Hardness	15 Shore A
Tensile Strength	0.7 MPa
Electrical Properties	Insulating
Shelf Life	12 months

Blanket

Colour	Off-white
Density	96 kg/m ³
Working Temperature	1200°C

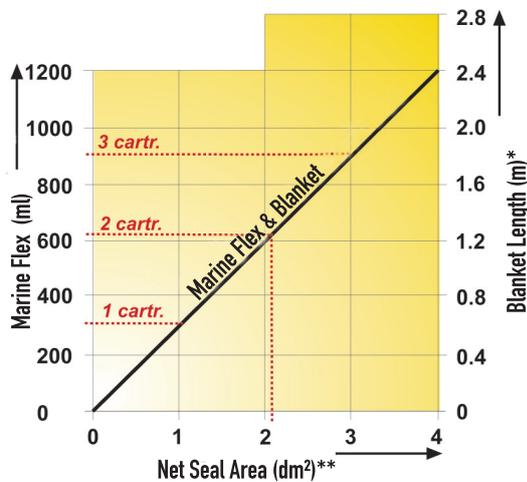
TECHNICAL ASSISTANCE

Contact FireSeal for any further details you may require.

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

MATERIAL CONSUMPTION (Estimated)

Figure 1:
Materials consumption for A Class Seal



* Blanket 100 mm wide pre-cut strip.

** Net Area = Sleeve cross sectional area less pipe cross sectional area.

PACKING

Marine Flex System is supplied as:

- Marine Flex, 310 ml cartridge
- Blanket, strips 7300 x 600 x 25 mm. (1 roll)
- Blanket, strips 7300 x 100 x 25 mm. (6 roll)

The products should be stored dry up to 25°C

SLEEVE DESIGN

The sleeve min 2 mm thickness to be continuously welded.

Distance between between the penetrating pipe and the sleeve must be minimum 10 mm.

SLEEVE INSULATION

The longer part of the sleeve must be insulated with a non-flammable mineral wool, min density 80kg/m³.

Insulation thickness: 40 mm for sleeve O.D. ≤ 150 mm
50 mm for sleeve O.D. ≥ 150 mm

The division insulation is installed tightly around the sleeve and insulation must be thoroughly fixed onto the division insulation and the sleeve.

Pipes of ≥ 48,3 mm dia to be insulated at one side to 600 mm length with 50 mm thick approved insulating material. Copper pipes to be insulated 600 mm at both sides of the seal.

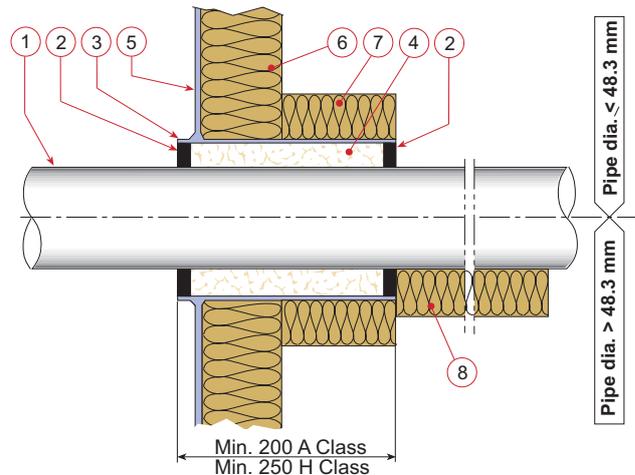


Figure 2:
Typical Marine Flex System penetration

Key:

- | | |
|-------------------------------|------------------------|
| 1 Metallic pipe | 5 Division plate |
| 2 Marine Flex, 15mm thickness | 6 Division insulation* |
| 3 Steel sleeve | 7 Sleeve insulation* |
| 4 Blanket | 8 Pipe insulation* |

*Yard supply

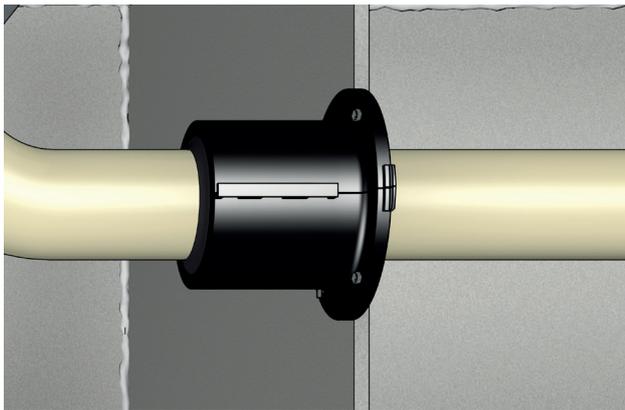
INSTALLATION DIRECTIVES

1. Remove all loose debris from the sleeve and make sure the seeve is free from dust, oil and moisture.
2. Roll or fold the Blanket in suitable sizes, insert into the sleeve. For water and gas tightness pipes has to be separated. Do the same on the oposite side. Leave a distance of nominal 15 mm thickness on each side of the sleeve.
3. Apply Marine Flex 15mm on both sides. Make sure it's applied in between the pipes. If nessesery use Spacers.
4. Even out the Marine flex with a sponge wetted with soap water or a spray bottle with soap water and a putty knife.
5. Remove any excess material with a cloth wetted with parafin or white spirit.
6. Insulate according to class requirements.
7. Leave to cure for atleast 24 hours, total curing time apprx. 5-7 days.

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

PIPELOCK

Plastic pipe penetrations



PipeLock – fire, smoke, gas and watertight seal

GENERAL

Pipelock is a pipe penetration seal developed to meet the requirements of IMO 2010 FTP Code Part 3. Pipelock is a very easy and quick fire sealing system aimed for plastic pipes that penetrates A0 - A60 fire cells and prevents fire, smoke, gas and water to spread into surrounding areas.

Pipelock is manufactured from high quality, fire resistant composite plastic material and can therefore resist very high temperatures (1200°C) and emits low smoke when burnt. An intumescent material is pre-installed inside the plastic sleeve. The material expands when exposed to heat/fire and squeezes the pipe to enclose and seal the penetration to prevent fire, smoke, gas and water into surrounding areas.

FUNCTION

When the Pipelock is affected by heat/fire the intumescent material within the sleeve activates. At temperatures of 120°C-150°C the material expands up to 8 times of it's original size, exerts a pressure of up to 5 Bar and effectively seals the gap between the pipe and the barrier it penetrates. As heat increases the surface layer of the intumescent material forms a fire resistant char preventing the passage of fire, smoke, gas and water.



INSTALLATION

The Pipelock sleeve is manufactured in two parts that easily inter lock without any loose parts. The Pipelock is fixed direct on to the bulkhead or deck. The Pipelock is fixed in position with self tapping screws or tack welding using the metal plates moulded in to the Pipelock.

To seal the passage of smoke or gas and to achieve a watertight seal the gap between the pipe and bulkhead/deck penetration with Marine Flex.

ADVANTAGES

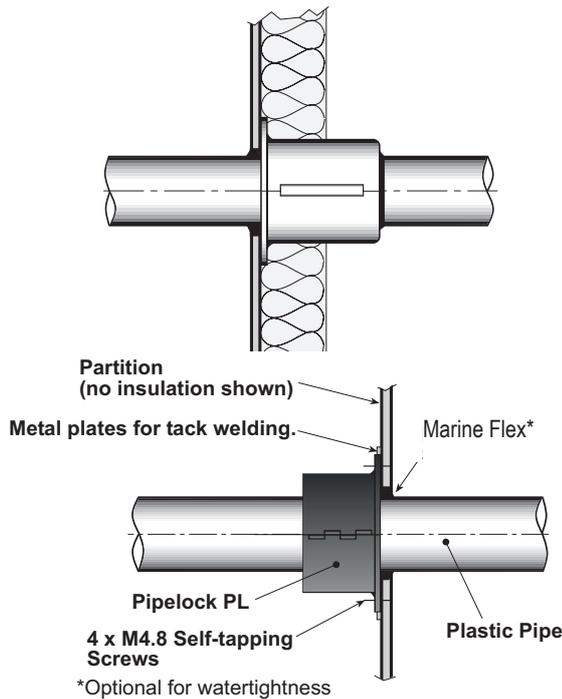
- Easy and quick installation.
- Maintenance free.
- Withstands rough weather conditions.
- Suitable for most sizes of plastic pipes.
- Widely approved by class societies.

TECHNICAL ASSISTANCE

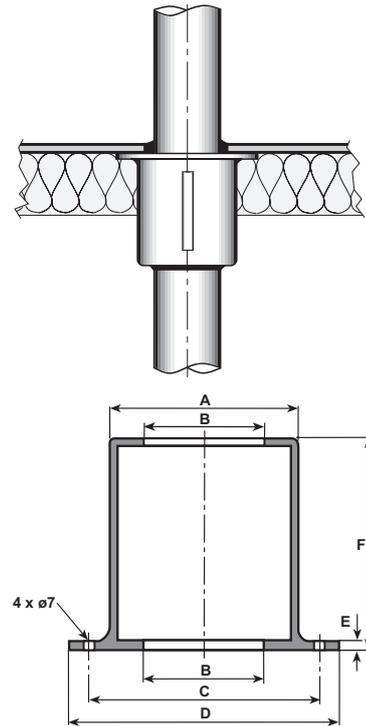
Please contact FireSeal for any further details you may require.

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

Bulkhead Penetration



Deck Penetration



TECHNICAL DATA

Fire rating:	A0 - A60
Sizes:	25, 55, 82, 110 and 160mm
Sleeve material:	Phenolic resin, glassfibre reinforced plastic. 160 mm steel sleeve
Intumescent material:	Graphite base
Sleeve colour:	Black
Activating temp:	120 - 150°C
Watertight:	3 Bar in conjunction with Marine Flex

ORDERING

When ordering, please specify:

- No. and size of PipeLock
- No. and color of the Marine Flex
- If required self tapping screws

Marine Flex consumption:

Approx. 20 ml sealant per running meter 6 x 6 mm.
Additional sealant may be needed if the pipe O.D. is substantially smaller than the PipeLock I.D.

Recommendations for use of our products are based on tests and information we believe to be reliable. Manufacturer or seller are not responsible for results where the products are used under conditions beyond our control. Specifications are subject to change without notice.

PL Type	Measures in mm							Lining THK
	Pipe O.D.	A	B	C	D	E	F	
25	≤ 25	60	25	85	105	7	100	4
55	25 ≤ 55	86	57	106	133	7	100	4
82	55 ≤ 82	118	84	146	168	7	100	8
110	82 ≤ 110	165	113	193	209	7	100	8
160	110 ≤ 162	219	163	243	268	2	160	20

INSTALLATION DIRECTIVES

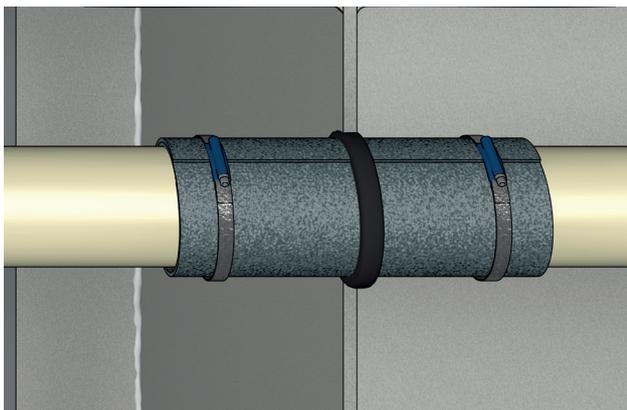
1. Determine the size of PipeLock sleeve needed.
2. Seal the gap between the pipe and partition with FireStop Sealant 3000 and apply a bead around the perimeter where the PipeLock flange meets the partition.
3. Assemble the two halves of PipeLock around the pipe.
4. Attach PipeLock firmly to partition surface by tack-welding or using 4 x self-tapping screws e.g. 4,8 x 32 mm.

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

Squeezer C

MARINE WRAP

Plastic pipe penetrations



Marine Wrap for easy and quick installation



GENERAL

Marine Wrap is a pipe penetration seal developed to meet the requirements of IMO 2010 FTP Code Part 3. Marine Wrap is a intumescent graphite wrapping material applied around plastic pipes that penetrates "fire cells" that are classified as A0-A60. The intumescent material expands when exposed to heat or fire and presses the plastic tube and thereby seals the opening and prevent the spread of fire, smoke and gas into the protected area. Marine Wrap is designed for single or multiple pipes in the same penetration.

FUNCTION

When Marine Wrap is affected by heat at 120-150°C the intumescent material reacts. The material expands up-to 8 times it's installation size, exerts a pressure up-to 5 Bar and effectively seals the gap between the pipe and the penetration barrier. As the heat increases the surface layer of the intumescent material forms a fire-resistant char preventing the passage of fire, smoke and gas.

INSTALLATION

Marine Wrap can be cut in various lengths to fit different pipe dimensions. Marine Wrap has the same width (150 mm) for all dimensions of plastic pipes. Marine Wrap is fitted around the plastic pipe with two hose clamps, one on each side of the bulk head. In deck installations the hose clamps can be fitted only from underneath. To prevent passage of cold smoke or gas, seal the gap between the partition and the Marine Wrap with Marine Flex.

ADVANTAGES

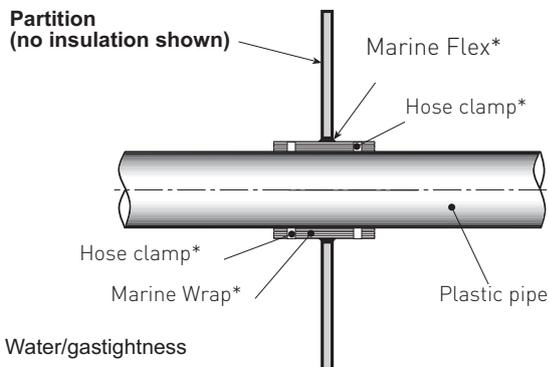
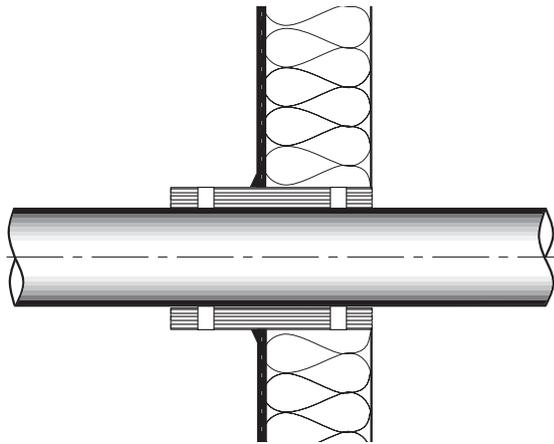
- Easy and quick installation.
- Maintenance free.
- Withstands rough weather conditions.
- Suitable for most sizes of plastic pipes.
- Multiple pipes allowed.
- Widely approved
- Cost effective solution.

TECHNICAL ASSISTANCE

Contact FireSeal for any further details you may require.

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

Bulkhead Penetration



TECHNICAL DATA

Fire rating:	A0 - A60
Pipe Sizes diameter:	10-160 mm
Intumescent material:	Graphite base
Activating temperature:	120-150°C
Storage/Shelf life:	Unlimited if stored dry

ORDERING

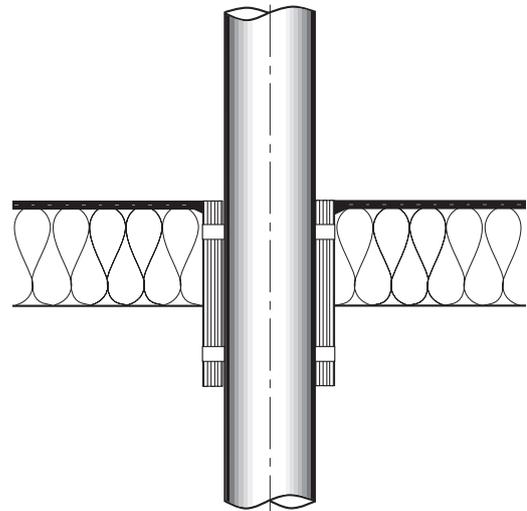
When ordering, please specify:

- No. and type of Marine Wrap material.
- No. of Marine Flex cartridges.
- No. of hose clamps.

Marine Flex consumption:

Approx. 20 ml sealant per running meter of bead measuring 6 x 6 mm. Additional sealant may be needed if the pipe O.D. is substantially smaller than the Squeezer partition hole.

Deck Penetration



SQ C Type	Measures in mm				
	Pipe O.D.	Width	Length	Layers	Lining THK
50	≤ 50	150	370	2	1,5/layer
75	51 ≤ 75	150	530	2	1,5/layer
110	76 ≤ 110	150	1150	3	1,5/layer
160	111 ≤ 160	150	2750	5	1,5/layer

2 pce hose clamps [12x0,7] for each Marine Wrap

INSTALLATION DIRECTIVES

1. Determine the size of plastic Pipe.
2. Wrap the Marine Wrap around the plastic pipe and push it to the center.
3. Mount the hose clamps around the graphite material, one on each side of the bulk head. If installed in deck the clamps can be mounted on the underside.
4. Seal the gap between the Marine Wrap and the partition with Marine Flex.

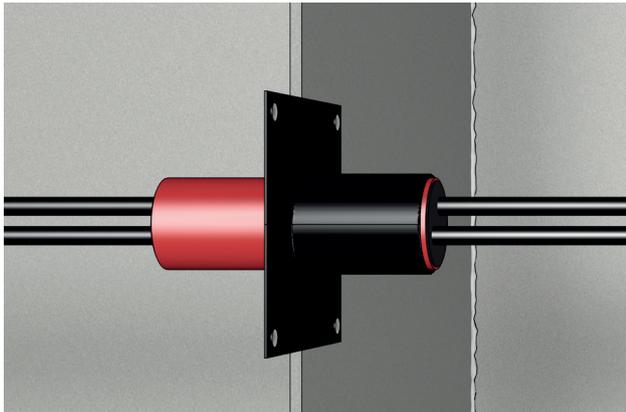
Recommendations for use of our products are based on tests and information we believe to be reliable. Manufacturer or seller are not responsible for results where the products are used under conditions beyond our control. Specifications are subject to change without notice.

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

Kniparen

INTUMESCENT SLEEVE

Cable Penetration



Intumescent Sleeve resists large movements and strong vibrations

AREA OF USE

Intumescent Sleeve is a single or multiple cable seal developed to meet the requirements of IMO 2010 FTP Code Part 3.

Attached to the barrier by self tapping screws or tack welding. It can be used both in deck and bulkhead applications.

Intumescent Sleeve stops spread of fire, smoke, gas and water. The elasticity and strength of sealing material offers a flexible seal that resists large movements and strong vibrations without cracking, deforming or loss of adhesion.

Intumescent Sleeve is not intended for areas continuously immerst by water and not exceeding 75% humidity

MATERIALS

The penetration seal consists of a 330 mm long steel tube internally coated with a thin intumescent coating. The outer ends of the tube is sealed with Marine Flex which offers a water tight bond between the penetrating cable and the tube. The tube is fixed to a flanged connector which is fixed by using self tapping screws or tack welding to the barrier.

TECHNICAL ASSISTANCE

Contact FireSeal for any further details you may require.



TECHNICAL PROPERTIES

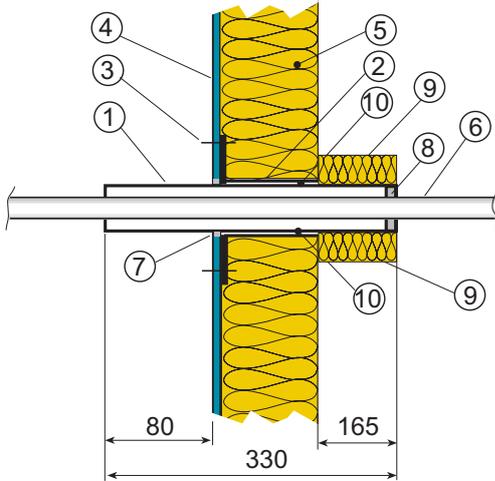
Fire Rating	A0 - A60
Sound attenuation	40 dBA
Tube outer diameter	50 mm
Tube inner diameter	47 mm
Tube length	330 mm
Thickness of sealant	> 5 mm

Marine Flex:

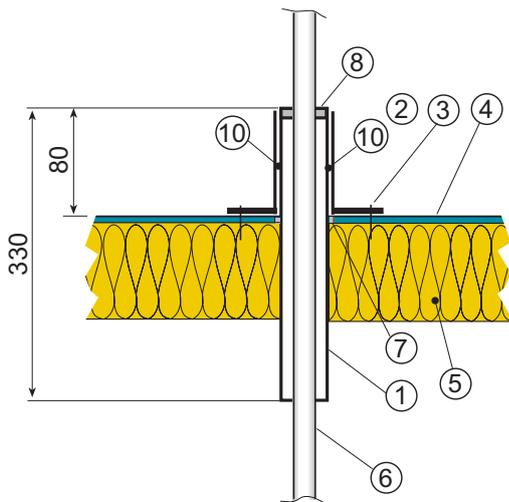
Colour	Black
Density	1400 kg/m
Application temperature	5 - 35 C
Operational temperature	-65 - 250 C
Curing time (7 mm thickness)	Apx. 3 days
Working time	20 - 30 minutes
Elongation	1300 %
Hardness shore A	15 shore A
Tensile strength	0.7 MPa
Electrical property	Insulating
Shelf life	12 months

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

Bulkhead Penetration



Deck Penetration



Key:

1. Intuscement Sleeve
2. Steel connector
3. Self tapping screw x 4
4. Barrier plate*
5. Barrier insulation*
6. Penetrating cable
7. Marine Flex, smoke seal
8. Marine Flex, end seal
9. Barrier insulation*
10. Marine Flex

*Yard supply

Cable Penetration

A0 – A60 Class

Area of use:

Intended for single and multiple cable penetrations below or above the waterline.

Special properties:

- Simple installation - no special tools required.
- Connector can be tack welded onto barrier, if required.
- Change, repair or retrofits are made with ease.
- Tested to IMO Resolution A.754(18).

Technical Data

Fire rating	A0, A15, A30 & A60
Internal dia.	47 mm
Sound Reduction	Approx. 40 dB
Resiliency	± 1 mm, 100 Hz
Movements	± 20% of annulus.

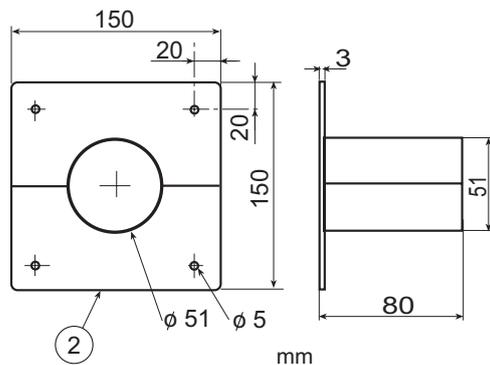
Moisture Protection

No moisture protection of seal surface required.

Technical Assistance

Contact FireSeal for specification, approval, certification or any further details.

Connector

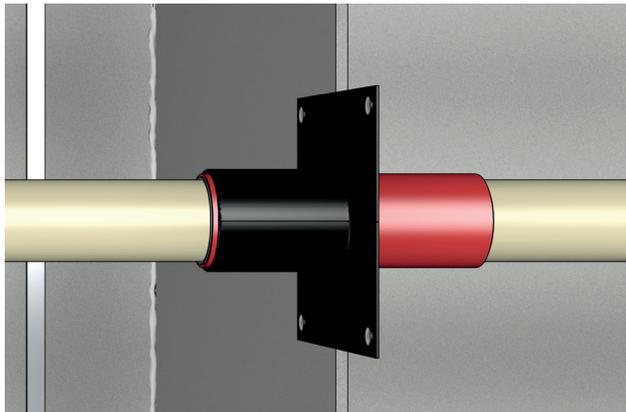


Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

INTUMESCENT SLEEVE

Plastic Pipe Penetration

Kniparen



Intumescent Sleeve resists large movements and strong vibrations

AREA OF USE

Intumescent Sleeve is a single or multiple plastic pipe seal developed to meet the requirements of IMO 2010 FTP Code Part 3.

Attached to the barrier by self-tapping screws or tack welding. It can be used both in deck and bulkhead applications.

Intumescent Sleeve stops spread of fire, smoke, gas and water. The elasticity and strength of sealing material offers a flexible seal that resists large movements and strong vibrations without cracking, deforming or loss of adhesion.

Intumescent Sleeve is not intended for areas continuously immersed by water and not exceeding 75% humidity.

MATERIALS

The penetration seal consists of a 330 mm long steel tube internally coated with a thin intumescent coating. The outer ends of the tube are sealed with Marine Flex which offers a water-tight bond between the penetrating cable and the tube. The tube is fixed to a flanged connector which is fixed by using self-tapping screws or tack welding to the barrier.

TECHNICAL ASSISTANCE

Contact FireSeal for any further details you may require.



TECHNICAL PROPERTIES

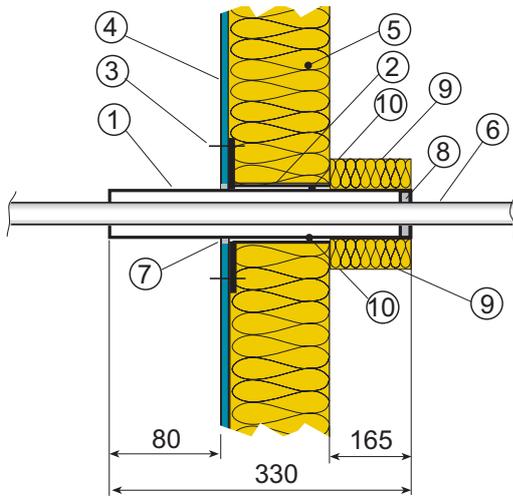
Fire rating	A0 - A60
Sound attenuation	40 dBA
Tube outer diameter	50 mm
Tube inner diameter	47 mm
Tube length	330 mm
Thickness of sealant	> 5 mm

Marine Flex:

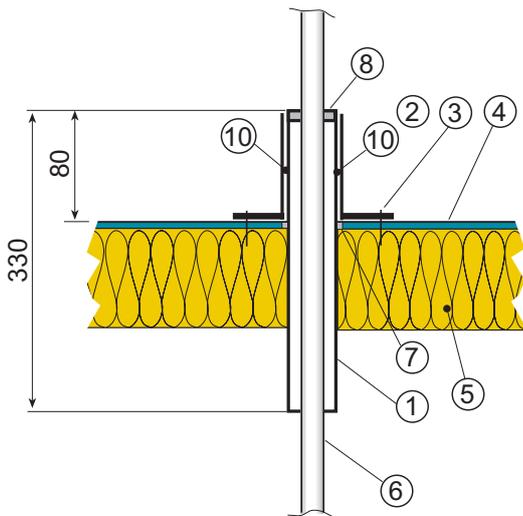
Colour	Black or White
Density	1400 kg/m
Application temperature	5 - 35 C
Operational temperature	-65 - 250 C
Curing time (7 mm thickness)	Abt. 3 days
Working time	20 - 30 minutes
Elongation	1300 %
Hardness	15 Shore A
Tensile strength	0.7 MPa
Electrical property	Insulating
Shelf life	12 months

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

Bulkhead Penetration Type K-B



Deck Penetration Type K-D



Key:

1. Intuscement Sleeve
2. Steel connector
3. Self tapping screw x 4
4. Barrier plate*
5. Barrier insulation*
6. Penetrating plastic pipe
7. Marine Flex, smoke seal
8. Marine Flex, end seal
9. Barrier insulation*
10. Marine Flex

*Yard supply

Plastic pipe penetration

A0 - A60 Class

Area of use:

Intended for single and multiple plastic pipe penetrations below or above the waterline.

Specially properties:

Movements or vibrations of the penetrating cables or plastic pipes are accepted.

- Simple installation - no special tools required.
- Connector can be tack welded onto barrier, if required.
- Change, repair or retrofits are made with ease.
- Tested to IMO Resolution A.754(18).

Technical Data

Fire rating	A0, A15, & A60 class
Internal dia.	47 mm
Sound Reduction	Approx. 50 dB
Resiliency	± 1 mm, 100 Hz
Movements	± 20% of annulus.

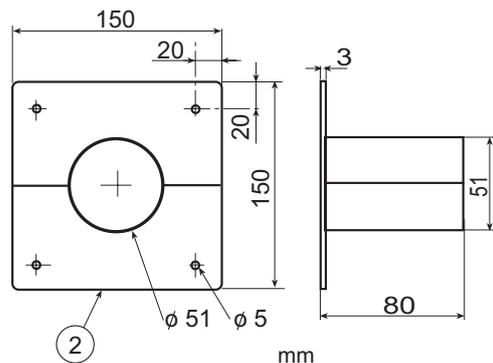
Moisture Protection

Not moisture protection of seal surface required.

Technical Assistance

Contact FireSeal for specification, approval, certification or any further details.

Connector



Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

MARINE MULTI MS

Adhesive & Sealing



AREA OF USE

Marine Multi MS is a fire rated adhesive, elastic and at the same time paintable sealant. Adheres thanks SMP base to various materials and surfaces. Marine Multi MS fulfils highest branch standards and also the requirements of the International Maritime Organization IMO, part 2+5.

Multipurpose marine grade sealant and adhesive suitable making elastic and vibration resistant joint seals. It can be used for a variety of interior and exterior sealing and bonding applications in the marine and offshore industry.

MATERIALS

For maximum adhesion strength a dry, clean, grease free and structurally proper surface is required. On smooth, non-absorbent substrates a pre-cleaning with rubbing alcohol or isopropyl is recommended. Porous surfaces may need to be grinded, free of dust and cleaned.

TECHNICAL ASSISTANCE

Contact FireSeal for any further details you may require.

TECHNICAL PROPERTIES

Chemical base	Silane Modified Polymer
Mechanism of curing	1 comp.moisture curing
Shore A hardness, DIN 53505	26
Modulus elongation at 100%*	ca. 0.9 N/mm ²
Elongation at break*	ca. 225 %
Elastic recovery at elongation of 60% **	> 60 %
Tensile strength*	ca. 1.5 N/mm ²
Movement capability	20 %
Consistency, DIN EN ISO 7390	Stable, ≤ 3 mm
Tooling time	max. 15 min.
Curing rate after 24h	> 3.0 mm
Curing rate after 48h	> 4.5 mm
Density	1.47 ± 0.05 g/cm ³
Volume change, DIN EN ISO 10563	< 3 %
Temp. resistance after curing	- 40 °C to + 90 °C
Application temperature	+ 5 °C to + 40 °C
Shelf life	18 months
Colour	White
Cartridge	290 ml / 9.8 fl. oz.

All measurements were performed under normal conditions (23 °C and 50 % relative humidity).

* The data are based on measurements after 7 days according to DIN 53504 S2.

** according to DIN EN ISO 7389

Note: Technical details in this catalog are generic. See each class societies certificate for specifics.

Extract list of Offshore and Marine costumers using FireSeal Penetration Seal Systems

MIDDLE EAST

Lamprell, UAE
 Drydock Dubai, UAE
 Grandweld Shipyard, UAE
 ASRY Drydock, Bahrain
 Larsen & Toubro, OmanNDC, UAE
 Seven Seas Services, UAE

LATIN AMERICA

Pemex, Mexico
 Petrobras, Brazil
 Estaleiro Atlântico Sul, Brazil
 Tome Ferrostaal, Brazil
 BrasFels, Brazil
 SBM Offshore, Brazil
 Technip, Brazil

NORTH AMERICA

Bollinger Shipyards, LA
 Coastwide Electric, LA
 General Dynamics NASSCO, CA
 KeppelAmfels, TX
 Austal USA, AL
 Detyens Shipyard, SC
 Eastern Shipbuilding, FL
 Gulf Island Marine, LA
 Ingalls Shipbuilding, MS
 Master Boat Builders, AL
 Philly Shipyard, PA
 Senesco, RI
 Southland Energy, LA
 Vigor Shipyard, WA
 Vigor Shipyard, OR
 Waveguide Communications, FL

INDONESIA

PaxOcean Batamec Shipyard

MALAYSIA

Bumi Armada
 Malaysia Marine & Heavy Engineering Sabah Shipyard
 Labuan Shipyard & Engineering Ocean Might Shipyard
 Selat Melaka Shipbuilding Corporation

VIETNAM

Saigon Offshore Fabrication & Engineering Triyards HCMC
 PTSC MC
 Vard Yard Vung Tau
 SENCO Marine
 Pha Rung Shipyard
 Hong Ha Shipyard

RUSSIA

Krasnye Barrikady Shipyard
 Astrakhan Shipbuilding
 Yaroslavl Shipyard
 Vyborg Shipyard
 Kaliningrad Shipyard
 Volgograd Shipyard
 Khabarovsk Shipyard
 Vladivostok Shipyard

SOUTH KOREA

Hyundai Heavy Industries (HHI)
 Hyundai MIPO Dockyard (HMD)
 Daewoo Shipbuilding & Marine Engineering (DSME)
 Daewoo Shipbuilding & Engineering (DSEC)
 Samsung Heavy Industries (SHI)
 Hanjin Heavy Industries & Construction

SINGAPORE

Keppel Shipyard Tuas
 Keppel Shipyard Benoi
 Keppel Sing Marine
 Keppel Gul Yard
 Sembcorp Corp Marine
 Jurong Shipyard
 Baker Engineering
 Dundee Marine

CHINA

Yangzijiang Shipyard
 Yangzhou Dayang Shipyard
 Jiangzhou Union Shipbuilding
 Qingshan Shipyard
 COSCO Zhoushan Shipyard
 Wuhu Shipyard
 Zhejiang Shipyard
 DingHeng Shipbuilding
 Guangzhou Shipyard
 Beihai Heavy Shipbuilding
 Kouan Shipyard
 Huangpu Shipyard
 COSCO(Qidong) Shipyard
 Raffles Shipbuilding
 Tianjin Xingang Shipbuilding
 COSCO(DaLian) Shipyard
 Hudong Zhonghua Shipbuilding
 Wuchang Shipyard
 Wenchong Shipyard

INDIA

Shoft Shipyard
 Reliance Defence and Engineering
 Pipavav Shipyard
 Cochin Shipyard
 Goa Shipyard
 Mazagaon Dock Shipbuilders
 Titagarh shipyard
 L&T Shipbuilding
 Hindustan Shipyard
 Kakinada – Sembawang Shipyard



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Recommendation for use of our products are based on tests and information we believe to be reliable. Manufacturer or seller are not responsible for results where the products are use under conditions beyond our control. Specifications are subject to change without notice.

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The fireseal system originally developed to safeguard nuclear power plants

