



Confirmation of Product Type Approval

Company Name: FIRESEAL AB

Address: ESBOGATAN 14PO BOX 7091 SE 164 07 Sweden

Product: Fire Stop System

Model(s): Marine Flex System (180 mm) cable and pipe fire penetration sealing for A0 Class steel divisions.

Certificate Type	Certificate Number	Issue Date	Expiry Date
Product Design Assessment (PDA)	19-LD1933736-PDA	09-JAN-2020	07-JAN-2025
Manufacturing Assessment (MA)	18-GB3451596	30-APR-2018	29-APR-2023
Product Quality Assurance (PQA)	NA	NA	NA

Tier
3

Intended Service

Multi and single pipe/cable penetrations in Class A0 steel bulkheads and decks for Marine and Offshore Installations.

Description

Steel sleeve (180 or 200 mm length) welded to the steel deck/bulkhead plating. Marine Blanket packing (150 mm thickness) fitted into the steel sleeve and surrounding cables/pipes. External surfaces of Marine Blanket protected by a layer of Marine Flex (15 mm thickness) on both sides of the steel deck/bulkhead plating.

Sizes:

a) Steel sleeve circular from 48.0 mm up to 250,0 mm outer diameter and rectangular from 100x100 mm up to 700x300 mm, with single cables up to 85 mm OD , bunched cables upto 35 mm OD, with maximum fill ratio of 40%.

b) Steel sleeve circular from 48.0 mm up to 400,0 mm outer diameter and rectangular from 100x100 mm up to 700x400 mm, for steel pipes 17 mm OD up to 273 mm OD.

Ratings

Fire Rating: A0 Class.

Watertightness: 150 kPa for cable penetration, 200 kPa (without reinforcement) for pipe penetration.

Gastightness: 60 kPa for cable penetration, 3 kPa for pipe penetration.

Service Restrictions

- 1) Maximum and minimum sizes tested: O.D 85mm and O.D 11 mm for cables and OD 273 mm and OD 17 mm for pipes.
- 2) Not for use in tank boundaries.
- 3) Minimum distance between cable and steel penetration not to be less than 5 mm.
- 4) Penetrations not to be packed more than the maximum tested fill ratio.
- 5) A reduction factor (0.85) in accordance with 4-8-2/7.7.1 (c) of the ABS Marine Vessels Rules is to be applied to the current carrying capacity of the cables with regardless of size and number of bunched cables since a temperature rise test report is not submitted.
- 6) Unit Certification is not required for this product. If the manufacturer or purchaser's request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.

Comments

- 1) The installation is to be in accordance with the manufacturer's instructions in accordance with the application/limitations as per Drawings: Marine Flex System cable penetration- drawing no. FS-TP1911-04 Rev.- & Marine Flex pipe penetration-drawing no. FS-TP1911-03 Rev -
- 2) Watertight or fire rated bulkheads or decks for pipe and cable penetrations are to be examined and tested as per ABS Marine Vessels Rules 3-7-1/Table1 and 4-8-4/29.15.
- 3) When requested to be used in watertight bulkheads on passenger ships or special purpose ships, the penetration system has to comply with the requirements given in SOLAS (Consolidated Edition 2014) Ch.II -1 Reg. 13.2.3. This approval of penetrations passing through watertight bulkhead is not to be construed as a substitute for flag Administration's approval for the purpose of SOLAS (Consolidated Edition 2014)
- 4) The product or packing is to be marked with name of manufacturer, type designation and fire rating.
- 5) The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes, Drawings and Documentation

- SINTEF Fire Test Report No.103070.69A, dated 27 January 2014, Version 1
- SINTEF Fire Test Report No. 103070.69B, dated 27 January 2014, Version 1
- SP Fire Test Report No. 103070.73, dated 12 August 2014, Version 1
- SP Fire technical assessment report No. 103070.73-2, dated 20 August 2014, Version 2
- SP Fire technical assessment report No. 103205.30, dated 10 April 2014, Version 1
- Fireseal Pipe water tightness Report No. FSR-I-155-97, dated 18 December 1997
- Fireseal Pipe gas tightness Report No.FSR-C-260-06, dated 18 December 1998
- DNV Cable water tightness Survey Report No.PUS-13-58322, dated 15 October 2013
- DNV Cable gas tightness Survey Report No. PUS-13-56778, dated 30 August 2013
- Drawing No. FS-TP1911-03 Revision: - , Marine Flex System Pipe penetration
- Drawing No. FS-TP1911-04, Revision: - , Marine Flex System cable penetration

Term of Validity

This Product Design Assessment (PDA) Certificate remains valid until 07/Jan/2025 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

ABS Rules

2019 Rules for Building and Classing Marine Vessels: 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-6-2/9.7.1, 4-6-2/9.7.2, 4-8-4/21.13.1

2019 Rules for Building and Classing Mobile Offshore Units: 1-1-4/9.7, 1-1-A2, 1-1-A3, 4-2-1/11.15, 4-3-3/5.13.1, 5-1-1/3.5, 5-1-1/3.19, 5-1-1/3.21

International Standards

SOLAS (Consolidated Edition 2014) Chapter II-2 Regulation 9.3.1

IMO FTP Code 2010 Annex 1: Part 3

EU-MED Standards

NA

National Standards

NA

Government Standards

NA

Other Standards

NA



Corporate ABS Programs
American Bureau of Shipping
Print Date and Time: 14-Jan-2020 7:54

ABS has used due diligence in the preparation of this certificate, and it represents the information on the product in the ABS Records as of the date and time the certificate is printed.

If the Rules and/or standards used in the PDA evaluation are revised or if there is a design modification (whichever occurs first), a PDA revalidation may be necessary.

The continued validity of the MA is dependent on completion of satisfactory audits as required by the ABS Rules. The validity of both PDA and MA entitles the product to receive a **Confirmation of Product Type Approval**.

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or

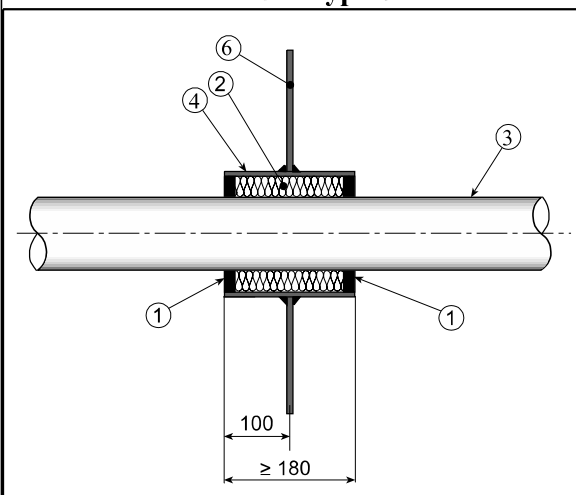
prior to the effective date of the ABS Rules and standards applied at the time of PDA issuance. ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. The manufacturer is responsible to maintain compliance with all specifications applicable to the product design assessment. Unless specifically indicated in the description of the product, certification under type approval does not waive requirements for witnessed inspection or additional survey for product use on a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS.

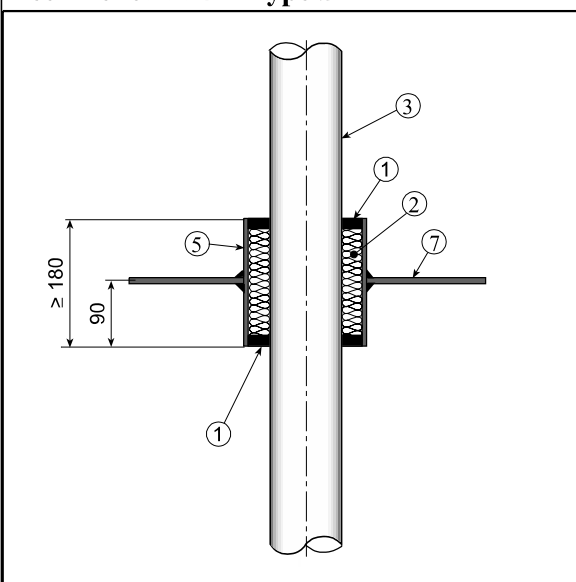
Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.

Bulkhead Penetration -Type SPD-B



Deck Penetration -Type SPD-D



Key:

1. Marine Flex, 15 mm thk (nom.).
2. Marine Blanket, 170 mm thk (nom.) 200 sleeve.
Marine Blanket, 150 mm thk (nom.) 180 sleeve.
3. Steel pipe from 17 O.D. up-to 273 O.D. mm.*
4. Bulkhead steel sleeve 200 mm long (min.), ≥ 3 mm thk.
Circular 48 mm O.D. up -to 400 mm O.D.* Rectangular
100x100 mm up -to 700x400 mm.*
5. Deck steel sleeve 180 mm long (min.), ≥ 3 mm thk.
Circular 48 mm O.D. up -to 400 mm O.D.* Rectangular
100x100 mm up -to 700x400 mm*
6. Steel Bulkhead plate.*
7. Steel Deck plate*.

*Yard supply

Marine Flex System

Pipe penetration with elastomer

A0 Class (Steel Division)

Area of use:

Intended for single pipe (SPD) and multiple (MPD) pipes penetrations below or above the waterline.

Specially properties:

Movements or vibrations of the penetrating pipes are accepted.

Simple installation - no special tools required.

Changes, repairs or retrofits are made with ease.

Filling holes not required.

Marine Flex System is tested to IMO 2010 FTP (2012 edition) Code Part 3.

Technical Data

Fire rating	A0 class
Watertightness	200 kpa (20 m W C) without reinforcement.
Gastightness	3 kpa
Sound Reduction	c. 50 dB
Resiliency	± 1 mm, 100 Hz
Movements	± 20% of annulus.
Moisture Protection	Not required.

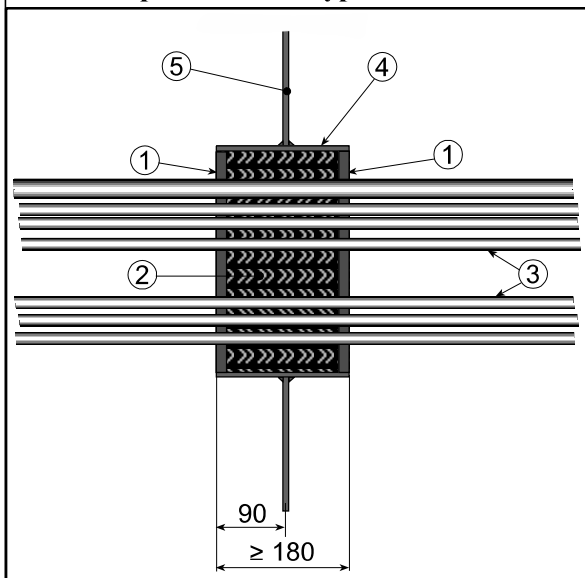
Technical support

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

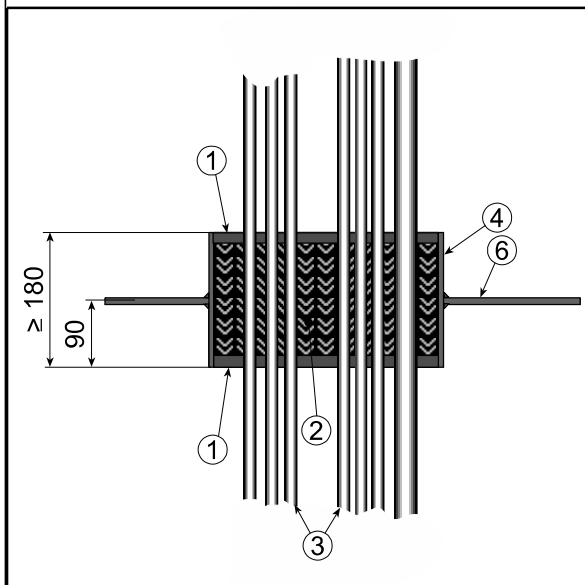
Note:

- a) General application of sleeve position accepted.
- b) Distance between pipe(s) and coaming ≥ 10mm

Bulkhead penetration -Type CD-B



Deck penetration -Type CD-D



Key:

1. Marine Flex, 15 mm thk. (nom.)
 2. Marine Blanket, 170 mm thk. (nom.) 200 sleeve
Marine Blanket, 150 mm thk. (nom.) 180 sleeve
 3. Penetrating cables*
 4. Steel sleeve 180 mm long (min.), ≥ 3 mm thk,
Circular 48 mm O.D. up -to 250 mm O.D.*
Rectangular 100x100 mm up -to 700x300 mm*
 5. Steel Bulkhead plate*
 6. Steel Deck plate*
- *Yard supply

Marine Flex System Cable penetration with elastomer A0 Class (Steel Division)

Area of use:

Specially suitable for small and large penetrations below or above the waterline.

Specially properties:

Movements or vibrations of the penetrating cables are accepted.

Simple installation - no special tools required.

Changes, repairs or retrofits are made with ease.

Filling holes not required.

Marine Flex System is tested to IMO 2010 FTP (2012 edition) Code Part 3.

Technical Data

Fire rating	A0 class
Watertightness	150 kPa (15 m W C)
Gastightness	60 kPa
Sound Reduction	c. 50 dB
Resiliency	± 1 mm, 100 Hz
Moisture Protection	Not required.

Technical support

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

Note:

Minimum distance between cable (s) and coaming ≥ 5 mm.

Well packed cable bundles accepted. Max. 40 % cable fill.

General application of sleeve position accepted.

