



CERTIFICATE NUMBER

10-LD644148-PDA

DATE

18 November 2010

ABS TECHNICAL OFFICE

London Engineering Department

# CERTIFICATE OF DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of  
**ESSVE PRODUKTER AB - SOLLENTUNA**

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate. It will remain valid as noted below or until the Rules or specifications used in the assessment are revised (whichever occurs first).

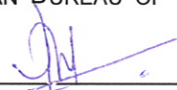
PRODUCT: Fire Stop System

MODEL: FS-Flex D Pipe and Cable penetration with elastomer, for H Class Divisions

ABS RULE: 2010 Steel Vessel Rules 1-1-4/7.7, 4-6-2/9.7, 4-8-4/21.13

OTHER STANDARD SOLAS Chapter II-2, Regulation 9.3;  
IMO Resolution A. 754(18); EN 1363-2;  
IMO FTP Code  
;

AMERICAN BUREAU OF SHIPPING

  
Mohammed K.M. Abbas  
Engineering Type Approval Co-ordinator

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

## ESSVE PRODUKTER AB

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MA Certificate No. 08-VS1096378-A

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**Product:** Fire Stop System

**Model:** FS-Flex D Pipe and Cable penetration with elastomer, for H Class Divisions

**Intended Service:**

Multi and single pipe/ cable penetrations in Class H-0 to H-60 bulkheads and decks.

**Description:**

250 mm steel sleeve welded to the deck/bulkhead plating. "Blanket D-24B" packing into the cavity between steel sleeve and cable/pipe. External surfaces protected by layer of "Firestop Sealant 3000", 15 mm thickness. Sleeve insulation 2 x 25 mm thick, Blanket D-24B fixed with pins. Pipe insulation 2 x 25 mm thick, Blanket D-24B on pipes with OD 48mm and above, fixed with wire.

**Ratings:**

Fire Rating H0 through H-60 Class. Watertight Pressure Resistance: 2.0 Bar g.

**Service Restrictions:**

1. FS-Flex D Cable Penetration: Maximum cable size 46 mm OD.  
Steel Coaming Size: 356 mm x 256 mm x 3 mm thick with a maximum cable fill ratio of 13%  
Steel Coaming Size: 60mm OD x 2.6 mm thick with a maximum fill ratio of 5.14%.
2. FS-Flex D Pipe Penetration: Steel pipe from 17.2 mm OD to 219.1 mm OD.  
Steel Coaming Size: 124 mm x 76 mm x 2 mm thick, 533 mm x 318 mm x 4 mm thick.  
Steel Coaming Size: 76.1 mm OD x 2.9 mm thick, 318 mm OD x 4 mm thick.
3. Not for use in tank boundaries.
4. 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. All seal types should be installed in accordance with manufacturer's ABS approved installation drawing numbers FSH-O-500-10, FSH-O-501-10.
2. Insulation material is to be H class approved type and properly installed to the satisfaction of the Surveyors.

**Notes / Drawings / Documentation:**

Sintef test report nos. 103070.35A dated 06 December 2004, 103070.35B dated 01 December 2004, 103070.37 dated 10 March 2005.

**Term of Validity:**

This Product Design Assessment (PDA) Certificate 10-LD644148-PDA, dated 18/Nov/2010 remains valid until 17/Nov/2015 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

**STANDARDS**

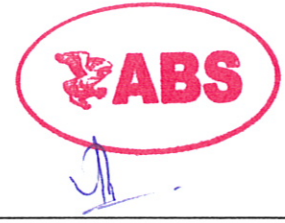
**ABS Rules:**

2010 Steel Vessel Rules 1-1-4/7.7, 4-6-2/9.7, 4-8-4/21.13

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**National:**

NA

**International:**

SOLAS Chapter II-2, Regulation 9.3;  
IMO Resolution A. 754(18); EN 1363-2;  
IMO FTP Code

**Government Authority:**

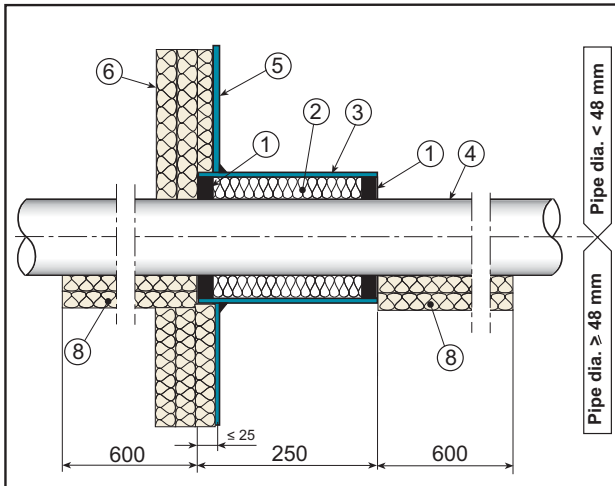
NA

**EUMED:**

NA

**Others:**

NA

**Bulkhead penetration -Type SPDH -B**

**FS-Flex D**
**Pipe penetration with elastomer  
H0 - H60 Class**
**Area of use:**

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

**Specially properties:**

Movements or vibrations of the penetrating pipes are accepted.

Simple installation - no special tools required.

Filling holes not required.

FS-Flex D is tested to IMO Resolution A.754 (18).

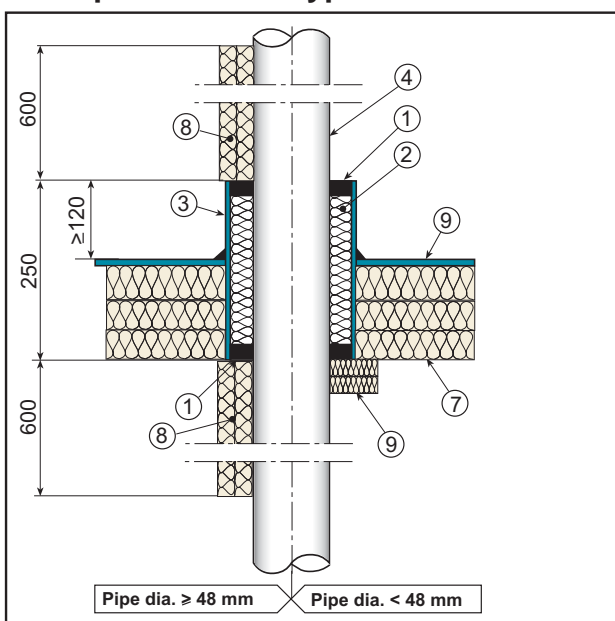
**Technical Data**

Fire rating	H0 - H60 class
Watertightness	250 kpa (25 m W C) without reinforcement.
Sound Reduction	c. 50 dB
Resiliency	$\pm 1$ mm, 100 Hz
Movements	$\pm 20\%$ of annulus.
Moisture Protection	Not required.

**Technical support**

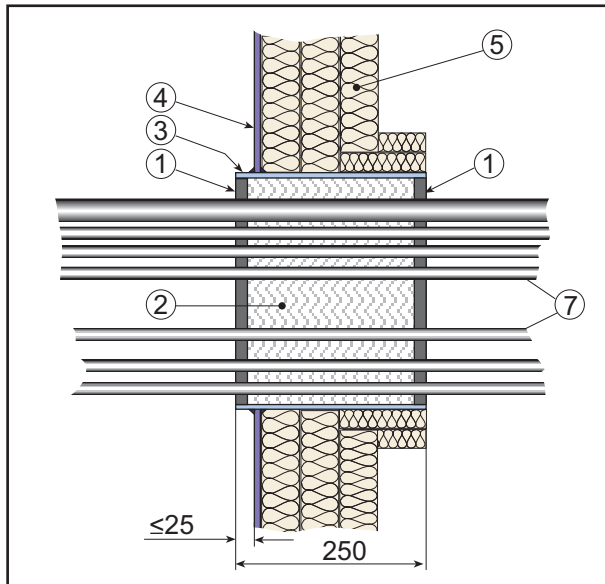
Contact FireSeal for specification, approval, certification or any further details.

Note: Distance between pipe(s) and coaming  $\ge 10$  mm

**Deck penetration -Type SPDH -D**

**Key:**

1. FireStop Sealant 3000, 15 mm thk (nom.).
2. Blanket D-24B.
3. Steel sleeve 250 mm long (min.),  $\ge 4$  mm wall thk., size from 76 O.D. up -to 533 x 318 mm\*.
4. Steel pipe from 17 O.D. up -to 219 O.D. mm\*.
5. Bulkhead plate.
6. Approved H class Bulkhead insulation, 3 x 50 mm (128) calcium silicate blanket fixed with pins fully insulated penetration at exposed side\*.
7. Approved H class deck insulation, 1 x 50 mm (128) + 2 x 38 mm (96) calcium silicate blanket fixed with pins, fully insulated penetration at exposed side\*.
8. Pipe insulation 2 x 25 mm thk. Blanket D-24B on pipes  $\ge 48$  O.D.mm. fixed with wire.
9. Sleeve insulation 2 x 25 mm thk. Blanket D-24B, fixed with pins.
10. Deck Plate\*.

\*Yard supply

**Bulkhead penetration -Type CDH -B**

**FS-Flex D**
**Cable penetration with elastomer  
H0 - H60 Class**

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.

Filling holes not required.

FS-Flex D is tested to IMO Resolution A.754 (18).

Technical Data

Fire rating	H0 - H60 class
Watertightness	250 kpa (25 m W C) without reinforcement.

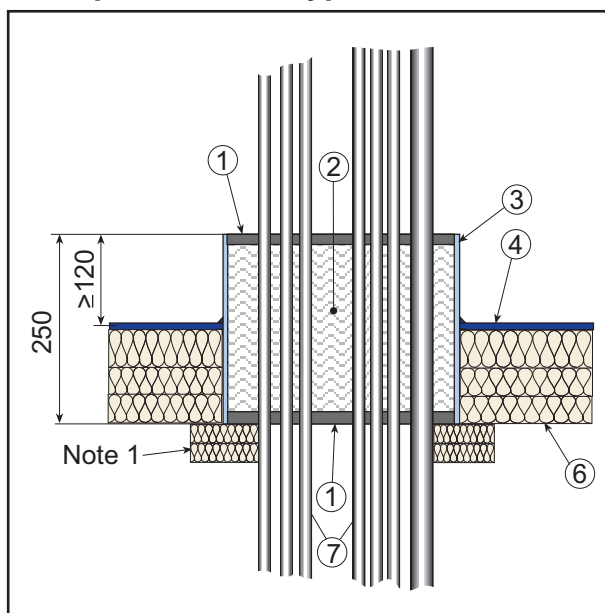
Sound Reduction	c. 50 dB
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Resiliency	± 1 mm, 100 Hz
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Moisture Protection	Not required.
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Technical support

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

**Deck penetration -Type CDH -D**


Key:

1. FireStop Sealant 3000, 15 mm thk (nom.)
2. Blanket D-24B
3. Steel coaming 250 mm long (min.), ≥ 3 mm thk, size from 60 mm O.D. up -to 356 x 256 mm\*
4. Steel division plate\*
5. Approved H class Bulkhead insulation, 3 x 50 mm (128) calcium silicate blanket fixed with pins\*.
6. Approved H class deck insulation, 1 x 50 mm (128) + 2 x 38 mm (96) calcium silicate blanket fixed with pins\*.
7. Penetrating cables -Note 2\*

\*Yard supply

Note 1: Deck sleeve to be partly insulated.  
Sleeve insulation 2 x 25 mm thk.  
Blanket D-24B, fixed with pins.

Note 2: Minimum distance between cable (s) and coaming ≥ 5 mm.  
Well packed cable bundles accepted.  
Max. 40 % cable fill.