



## *Confirmation of Type Approval*

This is to certify that, pursuant to the Rules of American Bureau of Shipping (ABS), on 11/OCT/2007 the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) and a valid Product Design Assessment (PDA) for the below listed product, entitling the product to type approval. The validity of the Manufacturing Assessment is dependent on satisfactory audits as required by the Rules. The Product Design Assessment is valid only for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

For Date of ABS Rules used for evaluation; Please refer to the ABS Rules below.

This Confirmation of Product Type Approval is valid as of the date shown above for the below listed product.

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 evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that the Client has full responsibility for continued compliance with the evaluation standard, whether the standard is an ABS Rule or a non-ABS Rule. As specified in the ABS Rules, Unit Certification may be required in addition to Product Type Approval. Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product.

### ESSVE Produkter AB Model Name(s): FS-Flex D Transit

**Presented to:**

ESSVE Produkter AB  
P.O. Box 770  
S 191 27  
Sollentuna  
Sweden

**Intended Service:**

Fire rated flexible transit seal for use in shipboard deck and bulkhead penetrations

**Description:**

FS-Flex D Shipboard Cable Penetration: 200 mm mild steel sleeve (thickness 2 mm minimum), welded or bolted to the deck/bulkhead plating. "D-24B Silicate Blanket" packing into the cavity between steel sleeve and cables. External surfaces protected by layer of "Firestop Sealant 3000" fire retardant silicone elastomer, 15 mm thickness. Sleeve insulation non-flammable mineral wool of minimum thickness 40 mm, and density 80 kg/m<sup>3</sup> minimum; FS-Flex D Shipboard Pipe Penetration: 200 mm mild steel sleeve (thickness 2 mm minimum), welded or bolted to the deck/bulkhead plating. "D-24B Silicate Blanket" packing into the cavity between steel sleeve and pipe. External surfaces protected by layer of "Firestop Sealant 3000" fire retardant silicone elastomer, 15 mm thickness. Sleeve insulation non-flammable mineral wool of minimum density 80 kg/m<sup>3</sup> and minimum thickness as below; Pipe O.D. 150 mm and below - insulation 40 mm; Pipe O.D. above 150 mm - insulation 50 mm.

**Ratings:**

Fire Rating A0 through A-60 Class. Watertight Pressure Resistance: 2.0 Bar g.

**Service Restrictions:**

1. FS-Flex D Shipboard Cable Penetration: Maximum size of steel sleeve to be 800 x 400 mm; Minimum distance between cable and sleeve to be not less than 5 mm. Cable outside diameters up 75 mm may be installed extra insulation is to be provided as per the ABS approved drawings. 2. FS-Flex D Shipboard Pipe Penetration: Maximum size of steel pipe to be 273 mm outside diameter, maximum size of copper pipe to be 108 mm outside diameter. Bulkhead transits for pipes with outside diameters of 60.3 mm and above to be insulated to minimum length of 600

mm with sleeve insulation 50 mm thick. 3. Frames may be packed up to a maximum density of 40% fill ratio. 4. Not for use in tank boundaries. 5. 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:**

Not Applicable

**Notes / Documentation:**

This Product Design Assessment (PDA) is valid only for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

**Term of Validity:**

This Design Assessment Certificate number 98-QA3010/3-PDA, dated 09/Oct/2007 will expire on 20/Nov/2011 or at an earlier date should there be alterations to the product's design or changes to the referenced ABS Rules and other specifications, which affect the product. Product use on or after 1 January 2008, will be subject to compliance with the ABS Rules or specifications in effect when the vessel, MODU or facility is contracted. The product's acceptability on board ABS-classed vessels or facilities is defined in the service restrictions of this certificate.

**ABS Rules:**

This Product Design Assessment (PDA) is valid only for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product as follows: 2006 Steel Vessel Rules 1-1-4/7.7 & 4-6-2/9.7

**National Standards:****International Standards:**

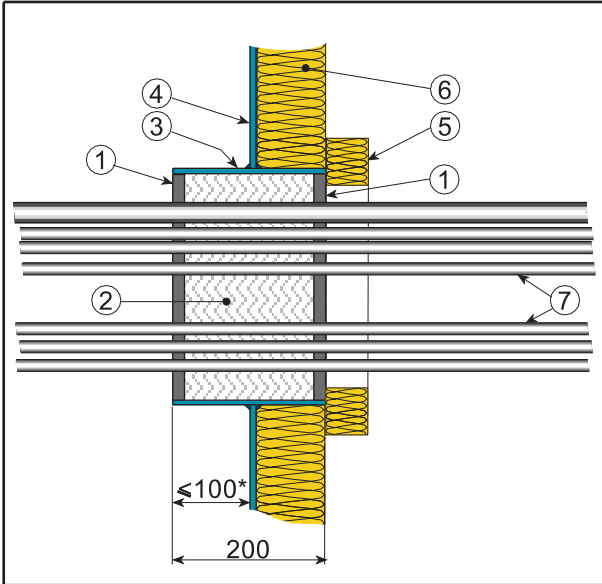
IMO Resolution A.754(18)

**Government Authority:****EUMED:****Others:**


Manager, ABS Programs

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 was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. 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 CD-B



## FS-Flex D

### Cable penetration with elastomer A0 - A60 Class

#### Area of Use

Specially suitable for small and large penetrations.

#### Special Properties

Movements or vibrations of the penetrating cables are accepted.

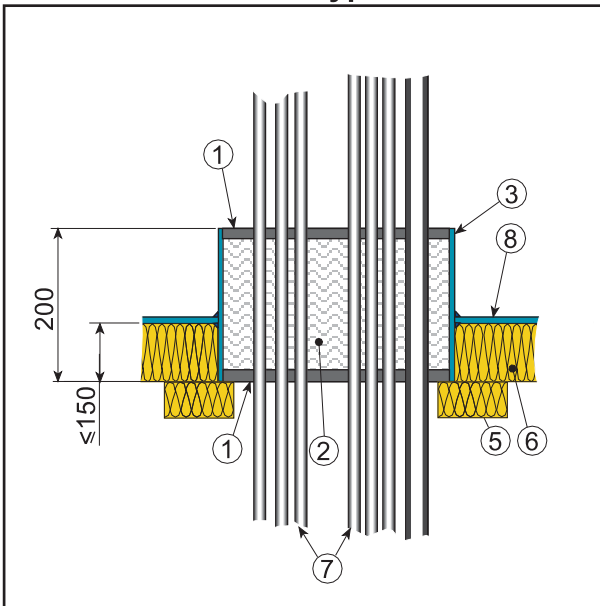
Simple installation - no special tools required.

Changes, repairs or retrofits are made with ease.

Lightweight coaming - no filling holes required.

Prefabricated sleeves with screw fixing optional.

### Deck Penetration - Type CD-D



#### Technical Data

Fire Rating	A0, A15, A30 & A60 class
Watertightness	250 kPa (25 mWC) without reinforcement
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.

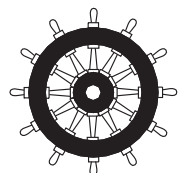
\* Equispaced sleeve accepted

#### Key:

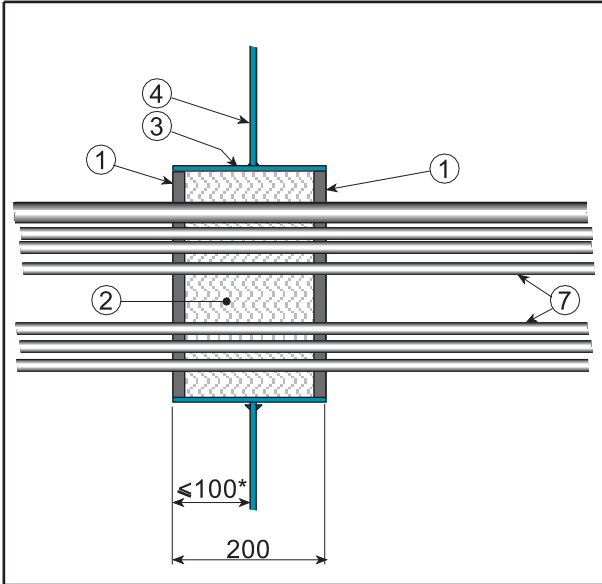
- 1 FireStop Sealant 3000, 15 thk (nom.)
- 2 D-24B alcium Silicate Blanket
- 3 Steel sleeve 200 long with 2 wall thk (min.), size from 48 O.D. up-to 800 x 400\*\*
- 4 Division plate\*\*
- 5 Sleeve insulation, RW 80, 40 thk\*\*
- 6 Division insulation to yard specification\*\*
- 7 Penetrating cables\*\*
- 8 Deck plate\*\*

Minimum distance between cable(s) and sleeve  $\geq$  5 mm.  
Well packed cable bundles accepted.  
Max. cable fill 40 %.

\*\*Yard Supply



### Bulkhead Penetration - Type CD-B



## FS-Flex D

### Cable penetration with elastomer A0 Class

#### Area of Use

Specially suitable for small and large penetrations.

#### Special Properties

Movements or vibrations of the penetrating cables are accepted.

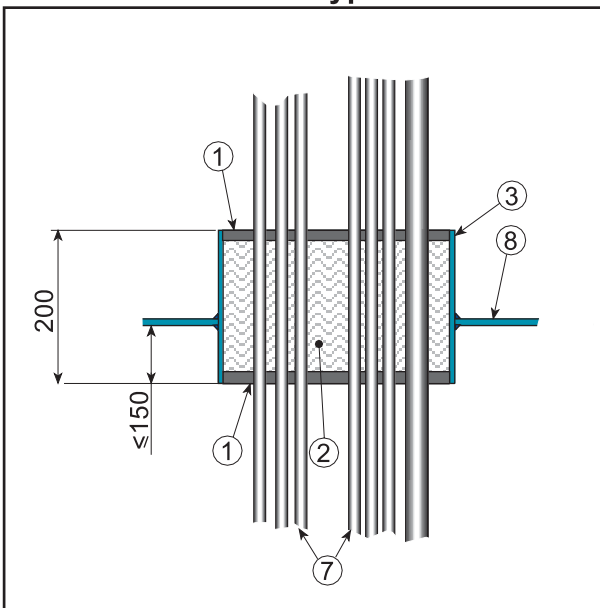
Simple installation - no special tools required.

Changes, repairs or retrofits are made with ease.

Lightweight coaming - no filling holes required.

Prefabricated sleeves with screw fixing optional.

### Deck Penetration - Type CD-D



#### Technical Data

Fire Rating	A0 class
Watertightness	250 kPa (25 mWC) without reinforcement
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.

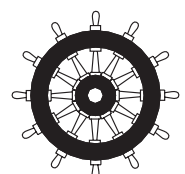
\* Equispaced sleeve accepted

#### Key:

- 1 FireStop Sealant 3000, 15 thk (nom.)
- 2 D-24B alcium Silicate Blanket
- 3 Steel sleeve 200 long with 2 wall thk (min.), size from 48 O.D. up-to 800 x 400\*\*
- 4 Division plate\*\*
- 7 Penetrating cables\*\*
- 8 Deck plate\*\*

Minimum distance between cable(s) and sleeve  $\geq$  5 mm.  
Well packed cable bundles accepted.  
Max. cable fill 40 %.

\*\*Yard Supply

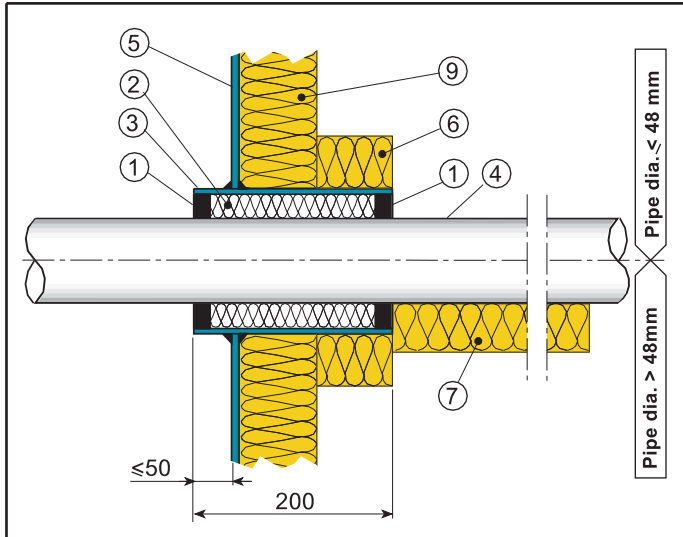




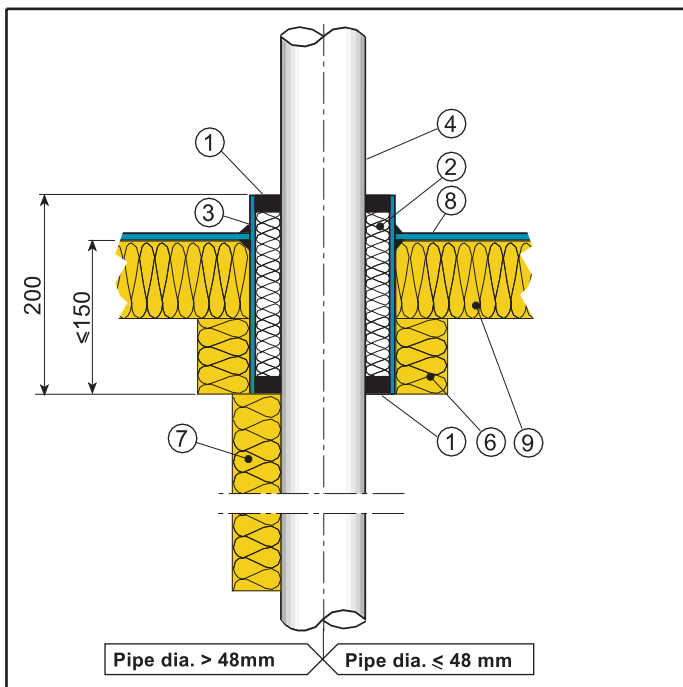
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Type  
**PD**

**Typical Bulkhead Penetration - Type SPD-B**



**Typical Deck Penetration - Type SPD-D**



Key:

- 1 Firestop Sealant 3000, 15 thk (nom.)
- 2 D-24B Calcium Silicate Blanket
- 3 Steel sleeve 200 long (min.), 2 wall thk (min.), size from 60 O.D. up-to 534 x 274 \*
- 4 Steel pipe from 17 up-to 273 O.D.\*
- 5 Bulkhead plate\*
- 6 Sleeve insulation RW 80, 40 thk for sleeve  $\le 150$  O.D.\*  
50 thk for sleeve  $> 150$  O.D.\*
- 7 Pipe insulation RW 80, 50 x 600 on pipes  $\ge 48.3$  O.D.\*
- 8 Deck plate\*
- 9 Division insulation to yard specification\*

\*Yard Supply

# FS-Flex D

## Pipe penetration with elastomer A0, A15, A30 & A60 Class

**Area of Use**

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

**Special Properties**

Movements or vibrations of the penetrating pipe are accepted.

Simple installation - no special tools required.

Changes, repairs or retrofits are made with ease.

Lightweight sleeve - no filling holes required.

Prefabricated, lightweight sleeves with screw fixing optional.

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

**Technical Data**

Fire Rating	A0, A15, A30 & A60
Watertightness	250 kPa (25 mWC) without reinforcement
Sound Reduction	c. 50 dB
Resiliency	$\pm 1$ mm, 100 Hz
Movements	$\pm 20\%$ of annulus

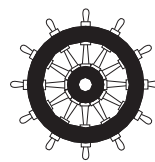
**Moisture Protection**

No moisture protection of seal surfaces required.

**Technical Support**

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

Also accepted for copper pipes ranging from 15 up-to 108 O.D. Pipes to be insulated both sides with RW 100, 50 thk and 600 length.



**MED-B-2975**  
**MED-D-547**  
**MED-B-2778/USCG**  
**MED-D-591 incl. USCG No. 164.138/EC1347/2735**



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.