

## CERTIFICATE OF FIRE APPROVAL

This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

**Manufacturer** Roxtec International AB

**Address** Rombvägen 2  
Box 540  
S-371 23 Karlskrona  
Sweden

**Type** PIPE PENETRATION (STANDARD FIRE TEST)

**Description** Fire Resisting Single Metallic Pipe Circular Penetrations- Type: "Roxtec SPM Seal" for applications in steel bulkheads and decks

**Specified Standard** IMO Res. MSC.307 (88) - (2010 FTP Code) Annex 1, Part 3

**The attached Design Appraisal Document forms part of this certificate.**

**This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.**

Date of issue 2 November 2017

Expiry date 30 June 2021

Certificate No. SAS F160195/M1

Signed



Sheet No 1 of 6

Name

S. Abraham  
Surveyor to Lloyd's Register EMEA  
A Member of the Lloyd's Register Group

**Note:**

**This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.**

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## DESIGN APPRAISAL DOCUMENT

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### ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F160195/M1

This Design Appraisal Document forms part of the Certificate.

#### APPROVAL DOCUMENTATION

SP Technical Research Institute of Sweden, Boras, Sweden; Fire Test Reports No: 5P03451 dated 3 November 2015, 5P03457 dated 12 November 2015, 5P08346 dated 21 December 2015, 5P08343 dated 21 December 2015 and 5P08395 dated 17 March 2016, 6P05989 and 6P05989 both dated 24 October 2016 and 6P07565 dated 20 December 2016.

Danish Institute of Fire and Security Technology, Hvidovre, Denmark; Fire test report No: PGA10870A dated 13 December 2016.

Manufacturer's guidance drawings No: S1513650A, S1513651A, S1513652C and S1513653A (For reference purposes only; product applications to be in accordance with Conditions of Certification below)

#### CONDITIONS OF CERTIFICATION

1. For applications in A-60 Class steel bulkheads and decks, with approved insulation arrangements as described in Tables 1 and 2 below and also generally in accordance with manufacturer's guidance drawings No: S1513650A, S1513651A, S1513652C and S1513653A. Final insulation arrangements onboard are to be approved by the relevant project authority on a case-by-case basis
2. All "SPM Series" pipe seals were tested only in A-60 Class divisions, but not separately in A-0 Class divisions in accordance with IMO Res. MSC.307(88)-(2010 FTP Code) Annex 1, Part 3 Appendix 2. A.III.2.2.1.1 Therefore for applications in A-0, A-15 and A-30 Class steel bulkheads and decks, they shall be fitted with the same or equivalent A-60 Class insulation arrangements as those used in the fire tests (including any insulation fitted on the penetration itself in the tests) for a minimum distance of 200mm around the penetration, on all fire risk sides of bulkheads and decks (as identified by the Design Plan Approval Authority for each project) and insulation should be extended to cover the full side(s) and the end face(s) of the steel frame, with an overlap of at least 20mm from the steel end plate edges. The above mentioned A-60 Class insulation arrangements should be additional to any thermal or acoustic insulation, but may include any fire rated insulation (e.g. A-15, or A-30) already fitted on the bulkhead or deck and/or on the penetration itself, such that the total fire rating is A-60
3. Roxtec "SPM Series" pipe seals consist of: stainless steel circular plates fitted to the front and rear ends of the "Roxyton" rubber seal unit and secured using 5 stainless steel bolts and nuts fitted through the front and rear end plates and the "Roxyton" rubber seal unit. The "SPM" pipe seal unit is fitted around the pipes and secured to the steel bulkhead or deck by expansion of the rubber seal fitted through the aperture in bulkhead or deck plate, when the bolts are tightened. Constructional details of the Roxtec "SPM Series" pipe seals are to be as described in Roxtec drawing: S1502970 Rev. D
4. Approved arrangements for Roxtec "SPM Series" pipe seals in A-60 Class steel bulkheads and decks are as described in Table 1 and 2 below respectively. Each SPM pipe penetration seal is approved for use only with the specific size or size range of each type of pipe tested as described in the Tables
5. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype



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**Table 1: Approved arrangements in A-60 Class Steel Bulkheads:**

Seal	Tested Pipe Nominal Outside Diameter (in mm)	Pipe Material	Maximum Fire rating	Position of SPM seal in bulkheads/ General(a) or Restricted(b) Applications	Minimum diameter of as-tested or equivalent A-60 insulation Collar required around the penetration, on single side or both sides of bulkhead as applicable (in mm).	Minimum thickness/length of as-tested or equivalent A-60 insulation to be fitted along the pipe on single side or both sides of bulkhead as applicable, when measured from the Penetration insulation collar (if applicable) or bulkhead insulation (in mm).
SPM 39	12	Steel	A-60	Fire exposed side or Fire unexposed side (General Applications)	Not required	50/300 (Single side)
SPM 41	12	Steel	A-60	Fire exposed side or Fire unexposed side (General Applications)	Not required	50/300 (Single side)
SPM 81	45.4	Steel	A-60	Fire exposed side or Fire unexposed side (General Applications)	Not required	50/300 (Single side)
SPM 138	92	Steel	A-60	Fire unexposed side (insulated side)/Restricted applications	200 (Single side)	50/400 (Single side)
SPM 279	220	Steel	A-60	Fire exposed side or Fire unexposed side (General Applications)	200 (Both sides)	100/500 (Both sides)
SPM 39	12	Copper	A-60	Fire exposed side or Fire unexposed side (General Applications)	Not required	50/300 (Single side)
SPM 41	12	Copper	A-60	Fire exposed side or Fire unexposed side (General Applications)	100 (Single side)	50/400 (Single side)
SPM 81	45	Copper	A-60	Fire exposed side or Fire unexposed side (General Applications)	100 (Single side)	50/400 (Single side)
SPM 138	90	Copper	A-60	Fire exposed side or Fire unexposed side (General Applications)	200 (Single side)	50/600 (Single side)
SPM 279	220	Copper	A-60	Fire exposed side or Fire unexposed side (General Applications)	200 (Both sides)	100/700 (Both sides)

- (a) General applications refer to installation arrangements where the penetrations are accepted for use on any one side (fire exposed side or fire unexposed side) of the bulkhead.
- (b) Restricted applications refer to installation arrangements where the penetrations are accepted for use on the insulated side of the bulkhead in all cases.



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**Table 2: Approved arrangements in A-60 Class Steel Decks**

Seal	Tested Pipe Nominal Outside Diameter (in mm)	Pipe Material	Maximum Fire Rating	Position of SPM seal in Decks/General <sup>(a)</sup> or Restricted <sup>(b)</sup> Applications	Minimum diameter of as-tested or equivalent A-60 Class Insulation Collar required around the penetration on the underside, topside or both sides of deck as applicable of decks as applicable (in mm).	Minimum thickness/length of as-tested or equivalent A-60 Class insulation to be fitted along the pipe on the underside, topside or both sides of deck as applicable, when measured from the penetration insulation collar or deck insulation as applicable (in mm).
SPM 39	8 to 12	Steel	A-60	Fire exposed underside (Restricted Applications)	Not required	Not required
SPM 41	12	Steel	A-60	Fire exposed underside or Fire unexposed side (General Applications)	Not required	Not required
SPM 62	30	Steel	A-60	Fire exposed underside or Fire unexposed side (General Applications)	Not required	Not required
SPM 69	36	Steel	A-60	Fire exposed underside or Fire unexposed side (General Applications)	Not required	Not required
SPM 81	45.4	Steel	A-60	Fire exposed underside or Fire unexposed side (General Applications)	Not required	50/300 (Underside)
SPM 138	92	Steel	A-60	Fire exposed underside or Fire unexposed side (General Applications)	Not required	50/400 (Underside)
SPM 279	220	Steel	A-60	Fire exposed underside or Fire unexposed side (General Applications)	Not required	100/600 (Underside)
SPM 39	8 to 12	Copper	A-60	Fire exposed underside (Restricted Applications)	Not required	50/400 (Underside)
SPM 41	12	Copper	A-60	Fire exposed underside or Fire unexposed side (General Applications)	Not required	50/400 (Underside)
SPM 41	16	Copper	A-60	Fire exposed underside (Restricted Applications)	Not required	50/400 (Underside)
SPM 81	45.4	Copper	A-60	Fire exposed underside or Fire unexposed side (General Applications)	Not required	100/800 (Underside)



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**Table 2: Approved arrangements in A-60 Class Steel Decks (Continued)**

Seal	Tested Pipe Nominal Outside Diameter (in mm)	Pipe Material	Maximum Fire Rating	Position of SPM seal in Decks/General <sup>(a)</sup> or Restricted <sup>(b)</sup> Applications	Minimum diameter of as-tested or equivalent A-60 Class Insulation Collar required around the penetration on the underside, topside or both sides of deck as applicable of decks as applicable (in mm).	Minimum thickness/length of as-tested or equivalent A-60 Class insulation to be fitted along the pipe on the underside, topside or both sides of deck as applicable, when measured from the penetration insulation collar or deck insulation as applicable (in mm).
SPM 138	92	Copper	A-60	Fire exposed underside or Fire unexposed side (General Applications)	100 (underside)	100/800 (Underside)
SPM 196	143	Copper	A-60	Fire exposed underside (Restricted Applications)	100 (underside)	100/800 (Underside)
SPM 226	171	Copper	A-60	Fire exposed underside (Restricted Applications)	Not Required	100/1200 (Underside)
SPM 279	222	Copper	A-60	Fire unexposed side (topside)/Restricted applications	Not required	100/700 (Both sides)
SPM 279	222	Copper	A-60	Fire exposed underside (Restricted Applications)	Not Required	100/1200 (Underside)

- (a) General applications refer to installation arrangements where the penetrations are accepted for use on any one side (fire exposed side or fire unexposed side) of a steel deck, which is insulated on the fire exposed underside in all cases.
- (b) Restricted applications refer to installation arrangements where the penetrations are accepted for use only on one specific side (fire exposed side or fire unexposed side) of a steel deck, depending on the tested configuration as described in the Table, with the steel deck insulated on the fire exposed underside in all cases.

**NOTES**

1. Single "SPM Series" Pipe penetration seals, types: "SPM 41", "SPM 81", "SPM 138" and "SPM 279" were subjected to a hydrostatic pressure of 1.5 bar for a period of 60 minutes with no leakage, followed by a helium gas pressure test at 1 bar for a period of 30 minutes with no leakage, as detailed in DNV-GL Reports No. N1417RRN dated 29 January 2016 and N1419WS4 dated 22 June 2016.
2. Roxtec SPM 39 seal with a single steel pipe of outer diameter 8mm, mounted in 4mm and 15mm thick steel plates, was subjected to a 60minutes watertightness test at 1.5bar followed by a 30minutes helium gas tightness test at 1bar, with the pressure applied from different sides of the seal, and no leakage was reported for the full test duration, as described in DNV-GL Survey Report No: N141805A dated 20 December 2016 and associated Test Report TST-000505.



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- The above mentioned Pipe penetration seals may be considered to prevent flooding or maintain gastight requirements on a ship approval basis. These types of penetrations are not suitable for tank boundaries and where the penetrations are subject to frequent immersion in fluids and are not suitable for applications identified in SOLAS, Chapter II-1, Regulation 13.2.3 for "Openings in watertight bulkheads below the bulkhead deck in passenger ships."

#### PLACE OF PRODUCTION

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LR07/2013.12

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#### Supplementary Type Approval Terms and Conditions

*This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).*