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	Box 540 S-371 23 Karlskrona Sweden
Type	**CABLE PENETRATION (STANDARD FIRE TEST)**
Description	Fire Resisting Single/Multiple Cable and Pipe Circular Penetrations – Type: "**R-Series**" for use in steel bulkheads and decks.
Specified Standard	IMO Res. MSC.61 (67)- (FTP Code) Annex 1 Part 3 IMO MSC/Circ.1120 IMO Res. MSC.307 (88)-(2010 FTP Code) Section 8

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	17 May 2017	Expiry date	27 May 2020
Certificate No.	SAS F150154/M1	Signed	
Sheet No	1 of 5	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.

Lloyd's Register EMEA
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Document number
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1

DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
17 May 2017	SOUTSO/SFS/TA/SA/WP25746023&WP21385944

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F150154/M1

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

Tests in accordance with IMO Res. MSC.61(67)-(FTP Code) Annex 1 Part 3:

Norwegian Fire Research Laboratory (SINTEF), Trondheim, Norway, Test Reports No: 103070.10A, dated 7 December 2001, 103070.23A and 103070.23B both dated 11 December 2002 and 103070.29A, dated 28 October 2003. SP Technical Research Institute, Boras, Sweden, Test report No: P602999 dated 23 January 2007.

Tests in accordance with IMO Res. MSC.307 (88)-(2010 FTP Code) Annex 1, Part 3:

Danish Institute of Fire and Security Technology, Hvidovre, Denmark; Fire Test Report No: PGA10651 dated 03 July 2015 and PGA10723A dated 4 February 2016

Manufacturer's drawings (for reference purposes only):

Roxtec drawing no: S1003901

CONDITIONS OF CERTIFICATION

Cable penetrations

1. For use in A-60 Class steel bulkheads and decks, with the cable penetrations fitted to the insulated side of steel bulkheads and top side of steel decks in all cases (restricted applications); the insulation arrangements for A-60 Class bulkhead and deck cable penetrations are to be as described in Roxtec drawing no: S1003901
2. For use in A-0, A-15, A-30 Class steel bulkheads and decks, all cable penetrations tested only in A-60 Class divisions, but not separately in A-0 Class divisions as required by IMO Res. MSC.307(88)-(2010 FTP Code) Annex 1, Part 3 Appendix 2. A.IV.2.2.1.1, are to 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) for a minimum distance of 200mm around the penetration, on all fire risk sides in bulkheads (as identified at the design stage by the Plan Approval Authority for the specific project) and on the underside in decks 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 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. The following penetrations in Table 1 below were tested separately in A-0 Class decks and therefore they may be accepted in A-0 Class decks with as-tested arrangements in lieu of the requirements in Condition 2. For use in A-15 and A-30 decks, these penetrations need not be fitted with a 200mm A-60 insulation collar around the penetrations (as described in Condition 2), however any A-60 insulation that was applied on these penetrations in the A-60 fire tests (as described in condition 1 above) shall be fitted for these applications, however the A-60 insulation may be replaced with A-15 or A-30 insulation respectively

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Table 1: Approved arrangements for cable penetrations in A-0 Class steel decks

Penetration type/size [a]	Application	Position of tested penetration in division/General[b] or Restricted[c] Applications	Approximate Cable fill ratio	Maximum cable diameter	Minimum Insulation arrangements required for A-0 divisions
R50	Steel decks only	Symmetrically/General Applications	40%	10.5	Insulation not required on or around the penetration
R200	Steel decks only	Symmetrically/General Applications	40%	39	Insulation not required on or around the penetration

(a) Tested penetrations and any intermediate sizes may be accepted
(b) General applications refer to installation arrangements where the penetrations are fitted either symmetrically or non-symmetrically to the fire exposed side or fire unexposed side of the deck
(c) Restricted applications refer to installation arrangements where the penetrations are fitted non-symmetrically to the topside of the deck in all cases

4. Penetration seals consist of: Roxtec mild steel sleeves 55mm deep, filled with "R" seal frames which hold the 60mm thick RM modules. The steel sleeves (5.6mm to 8.8mm thick) may be welded or bolted to the division
5. Tested Roxtec seal frame types: R and R EMC
6. Tested steel sleeve/frame sizes: SLR 70 up to SLR 200
7. 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

Pipe penetrations

1. For use in A-60 Class steel bulkheads and decks with approved arrangements as described in Tables 2 and 3 below
2. For applications in A-0, A-15, A-30 Class steel bulkheads and decks, all pipe penetrations tested only in A-60 Class divisions, but not separately in A-0 Class divisions as required by IMO Res. MSC.307(88)-(2010 FTP Code) Annex 1, Part 3 Appendix 2. A.III.2.2.1.1, are to 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 in bulkheads (as identified at the design stage by the Plan Approval Authority for the specific project) and on the underside in decks 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 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.

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Table 2: Approved arrangements in A-60 Class Steel Bulkheads:

Penetration type/size [a]	Maximum Pipe Nominal Outside Diameter(mm)	Maximum Fire rating	Position of tested penetration in division/General[b] or Restricted[c] Applications	Minimum diameter of A-60 Insulation Collar required around the penetration (mm).	Minimum total length of approved A-60 insulation to be fitted along the pipe, when measured from the Penetration insulation collar (if applicable) or bulkhead insulation (in mm).
R70	Single steel pipe of diameter 10mm	A-60	Restricted	150	Not required
R200	2 steel pipes of diameter 18mm and 50mm	A60	Restricted	150	Not required
R70	2 copper pipes, each of 10mm diameter	A-60	General	Not required	500
R200	3 copper pipes of diameter 10mm, 28mm and 54mm	A60	General	Not required	500

(a) Tested penetrations and any intermediate sizes may be accepted

(b) General applications refer to installation arrangements where the penetrations may be fitted either symmetrically or non-symmetrically to the fire exposed side or fire unexposed side of the bulkhead

(c) Restricted applications refer to installation arrangements where the penetrations are to be fitted non-symmetrically to the fire unexposed side of the bulkhead in all cases

Table 3: Approved arrangements in A-60 Class Steel Decks

Penetration type/size [a]	Maximum Pipe Nominal Outside Diameter (in mm)	Maximum Fire rating	Position of SPM seal in decks/ General[a] or Restricted[b] Applications	Minimum diameter of A-60 Insulation Collar required around the penetration, on the underside of the deck (in mm).	Minimum length of approved 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).
R70	Single steel pipe of diameter 10mm	A-60	General	150	Not required
R200	2 steel pipes of diameter 18mm and 50mm	A-30	General	150	Not Required

(a) Tested penetrations and any intermediate sizes may be accepted

(b) General applications refer to installation arrangements where the penetrations may be fitted either symmetrically or non-symmetrically to the fire exposed side or fire unexposed side of the deck

(c) Restricted applications refer to installation arrangements where the penetrations are to be fitted non-symmetrically to the fire unexposed side/topside of the deck in all cases

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PLACE OF PRODUCTION

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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).