

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-37123, Karkskrona, Sweden
Type	Pipe Penetration (Standard Fire Test)
Description	Pipe Penetration Types: Roxtec RS PPS & RS PPS/S single thermoplastic pipe penetration seals for use in A-rated steel and aluminium divisions
Trade Name	Roxtec RS PPS & RS PPS/S
Specified Standard	IMO Res. MSC.307(88) (2010 FTP Code) Annex 1 Part 3, 11 and section 8. IMO Res. MSC.61(67) IMO FTP Code Annex 1 Part 3 IMO/MSC/Circ. 1120 & 1488

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 North America, Inc. of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document and its supplementary Type Approval Terms and Conditions form 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.



Bruce McDonald

Technical Authority - Statutory to Lloyd's
Register North America, Inc.
A member of the Lloyd's Register group

1330 Enclave Parkway, Houston, Texas, 77077,
United States

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions, and this Design Appraisal Document forms part of the Certificate.

This Certificate is an Amendment of Certificate Number LR21431832SF

FIRE TEST REPORTS

Centrum Techniki Okretowej (Ship Design and Research centre S.A Gdansk) Test reports numbers; RS-19/B-356/E dated 18th October 2019, RS-19/B-424/E dated 27th November 2019, RS-19/B-256/E dated 20th August 2019, RS-19/B-020/E, RS-18/B484/E dated 10th December 2018, RS-18/B-293/E dated 13th September 2018, RS-19/B-224/E dated 1st August 2019, RS-18/B-291/E dated 20th August 2018 and RS-19/B-424/E dated 27th November 2021.

SP Technical research institute of Sweden (RISE). Test report number : P902394 dated 25th May 2009.

DBI Danish Institute of Fire and Security Testing. Test report numbers ; PGA11370A dated 20th February 2019, PGA11302A dated 16th January 2019, PGA10801A dated 29th August 2016 and PGA 11371A dated 20th February 2019

CONDITIONS OF CERTIFICATION

1. When installed in A-Rated (A-60 & A-0) steel and aluminium decks and bulkheads with approved insulation arrangements as detailed within Tables 1-6 (RS-PPS) and tables 7-12 (RS-PPS/S) and their applicable referenced drawings.
2. Roxtec RS PPS consists of two rubber seals with multidiameter technology, fitted around the plastic pipe and inserted at each end of a welded or bolted sleeve / coaming, generating a “back to back” arrangement. The two rubber seals encase a strip of provided intumescent material which is continuously wound around the plastic pipe before being inserted inside the sleeve / coaming. The sleeve / coaming may be of type “SLRS or “SLFRS”.
3. Penetration details are defined below in Tables 1-6 (RS PPS) and Tables 7-12 (RS PPS/S).
4. Roxtec RS PPS/S consists of a single rubber seal with multidiameter technology, incorporating an integrated strip of intumescent material and fitted around the plastic pipe and inserted into the end of a sleeve/ coaming. The sleeve / coaming may be of type “SLRS, “SLFRS” or “SLRSX”.
5. For applications in A-15 and A-30 rated steel divisions, insulation levels as per A-60 should be applied.
6. For penetrations in A-0 aluminium divisions additional insulation along the pipe may not be necessary, reference should be made to the applicable installation drawing to ensure the division is suitably insulated to ensure division integrity.
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.

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

8. The certificate holder is solely responsible for the products supplied under this Certificate and to ensure that their products, whether manufactured by themselves or their licensee manufacturers, if agreed by Lloyd's Register, are fully compliant with the relevant statutory regulations and Lloyd's Register Class rules as applicable and designed, manufactured and installed to the same quality and specifications as the prototype tested, including components that are designed and manufactured by third parties.
9. The test laboratory is solely responsible for all tests performed within the scope of this certificate and to ensure that the testing is conducted in full compliance with the relevant test standard, approved operational procedures, statutory regulations and Lloyd's Register requirements as applicable and to meet client objectives as per contractual agreements.

Table 1. RS- PPS series A-60 penetrations in Steel bulkheads

Steel Bulkheads A-60				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Side	Insulation Details for A-60	Drawing Reference (A-60)
ABS	16mm-140mm	Symetrical	150mm ring around the penetration on both sides of the bulkhead	S1570248
PB	16mm-140mm	Symetrical	150mm ring around the penetration on both sides of the bulkhead	S1570248
PE/HDPE	16mm-355mm	Symetrical	Sleeve insulation plus insulation to cover the edge of the seal	S1570248
PP/PPR/PPML/PPFR	16mm-125mm	Symetrical	150mm ring around the penetration on the insulated side of the bulkhead	S1570248
PVC (inc uPVC & cPVC)	16mm-160mm	Symetrical	150mm ring around the penetration on the insulated side plus a 200mm wrap of insulation around the pipe	S1570248
PE-AL-PE (multilayer pipe)	16mm	Symetrical	150mm ring around the penetration on the insulated side plus a 400mm wrap of insulation around the pipe	S1570266
	17mm-160mm	Symetrical	200mm ring around the penetration on the insulated side plus a 600mm wrap of insulation around the pipe	S1570266
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	90mm-315mm	Symetrical	Sleeve insulation plus insulation to cover the edge of the seal	S1570266

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01
Table 2. RS-PPS series A-60 penetrations in Steel Decks

Steel Decks A-60				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Side	Insulation Details for A-60	Drawing Reference (A-60)
ABS	16mm-140mm	Symmetrical	100mm ring around the penetration on the underside of the deck	S1570248
PB	16mm-110mm	Symmetrical	100mm ring around the penetration on the underside of the deck	S1570248
PE/HDPE	16mm-355mm	Symmetrical	Sleeve insulation plus insulation to cover the edge of the seal on the underside of the deck	S1570248
PP/PPR/PPML/PPFR	16mm-125mm	Symmetrical	100mm ring around the penetration on the underside of the deck	S1570248
PVC (inc uPVC & cPVC)	16mm-160mm	Symmetrical	100mm ring around the penetration on the underside of the deck	S1570248
PVDF	16mm-125mm	Symmetrical	100mm ring around the penetration on the underside of the deck	S1570248
PE-AL-PE (multi-layer pipe)	16mm-110mm	Symmetrical	100mm ring around the penetration on the underside of the deck	S1570266
Pre-insulated plastic bundle pipes (with outer insulated jacket passing through fire collar/seal)	75mm-96mm	Symmetrical	100mm ring around the penetration on the underside of the deck	S1570266
Pre-insulated plastic bundle pipes (with or without outer insulated jacket passing through fire collar/seal)	68-96mm	Symmetrical	Additional 100mm wrap of insulation around the pipe on the underside of the deck	S1570266
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	90mm-315mm	Symmetrical	Sleeve insulation plus insulation to cover the edge of the seal on the underside of the deck	S1570266

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 3. RS- PPS series A-0 penetrations in Steel bulkheads

Steel Bulkheads A-0				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Side	Insulation Details for A-0	Drawing Reference (A-0)
ABS	16mm-31mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve plus two further 150mm rings of insulation (one on each side of the bulkhead)	S1570334
	32mm-110mm	Symmetrical	No additional insulation required	S1570334
	111mm-140mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve plus two further 150mm rings of insulation (one on each side of the bulkhead)	S1570334
PB	16mm-140mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve plus two further 150mm rings of insulation (one on each side of the bulkhead)	S1570334
PE/HDPE	16mm-355mm	Symmetrical	Sleeve insulation and insulation to cover the edge of the seal, plus an additional 200mm ring of insulation to be installed around the sleeve	S1570334
PP/PPR/PPML/PPFR	16mm-125mm	Symmetrical	Additional 200mm and 150mm rings of insulation are to be installed around the sleeve	S1570334
PVC (inc uPVC & cPVC)	16mm-160mm	Symmetrical	Additional 200mm and 150mm rings of insulation to be installed around the sleeve plus a 200mm wrap of insulation around the pipe	S1570334
PE-AL-PE (multilayer pipe)	16mm-32mm	Symmetrical	No additional insulation required	S1570360
	33mm-160mm	Symmetrical	Two additional 200mm rings of insulation are to be installed around the sleeve plus a wrap of insulation around the pipe. Complete length of insulation from the structure to equal 600mm : see insulation drawing	S1570360
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	90mm-315mm	Symmetrical	Sleeve insulation and insulation to cover the edge of the seal, plus an additional 200mm ring of insulation to be installed around the sleeve	S1570360

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 4. RS-PPS series A-0 penetrations in Steel Decks

Steel Decks A-0				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Side	Insulation Details for A-0	Drawing Reference (A-0)
ABS	16mm-140mm	Symmetrical	Additional 200mm and 100mm rings of insulation are to be installed around the sleeve on the underside of the deck	S1570334
PB	16mm-110mm	Symmetrical	Additional 200mm and 100mm rings of insulation are to be installed around the sleeve on the underside of the deck	S1570334
PE/HDPE	16mm-355mm	Symmetrical	Sleeve insulation and insulation to cover the edge of the seal, plus an additional 200mm ring of insulation to be installed around the sleeve on the underside of the deck	S1570334
PP/PPR/PPML/PPFR	16mm-125mm	Symmetrical	Additional 200mm and 100mm rings of insulation are to be installed around the sleeve on the underside of the deck	S1570334
PVC (inc uPVC & cPVC)	16mm-160mm	Symmetrical	Additional 200mm and 100mm rings of insulation are to be installed around the sleeve on the underside of the deck	S1570334
PVDF	16mm-125mm	Symmetrical	Additional 200mm and 100mm rings of insulation are to be installed around the sleeve on the underside of the deck	S1570334
PE-AL-PE (multi-layer pipe)	16mm-32mm	Symmetrical	No additional insulation required	S1570360
	33mm-110mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve plus a 100mm long wrap of insulation around the pipe on the underside of the deck.	S1570360
Pre-insulated plastic bundle pipes (with outer insulated jacket passing through fire collar/seal)	75mm-96mm	Symmetrical	Additional 200mm and 100mm rings of insulation are to be installed around the sleeve on the underside of the deck	S1570360
Pre-insulated plastic bundle pipes (with or without outer insulated jacket passing through fire collar/seal)	68-96mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve plus a 100mm long wrap of insulation around the pipe on the underside of the deck.	S1570360
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	90mm-315mm	Symmetrical	Sleeve insulation and insulation to cover the edge of the seal, plus an additional 200mm ring of insulation to be installed around the sleeve on the underside of the deck	S1570360

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 5. RS-PPS series A-Class penetrations in Aluminium Bulkheads (A-0 and A-60)

Aluminium Bulkheads A-0 and A-60				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Side	Insulation Details for A-0 and A-60	Drawing Reference
PP/PPR/PPML/PPFR	16mm-110mm	Symmetrical	150mm ring of insulation around the penetration	S1570292
PE/HDPE	16mm-355mm	Symmetrical	Sleeve insulation plus insulation to cover the edge of the seal	S1570292
PVC (inc uPVC & cPVC)	16mm-160mm	Symmetrical	150mm ring of insulation around the penetration	S1570292
PE-AL-PE (multi-layer pipe)	16mm-110mm	Symmetrical	100mm ring of insulation around the penetration	S1570292
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	90mm-315mm	Symmetrical	Sleeve insulation plus insulation to cover the edge of the seal	S1570292

Table 6. RS-PPS series A-Class penetrations in Aluminium Decks (A-0 and A-60)

Aluminium Decks A-0 and A-60				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Side	Insulation Details for A-0 and A-60	Drawing Reference
PP/PPR/PPML/PPFR	16mm-110mm	Symmetrical	150mm ring around the penetration on the underside of the deck	S1570292
PE/HDPE	16mm-355mm	Symmetrical	Sleeve insulation plus insulation to cover the edge of the seal on the underside of the deck	S1570292
PVC (inc uPVC & cPVC)	16mm-160mm	Symmetrical	150mm ring around the penetration on the underside of the deck	S1570292
PE-AL-PE (multi-layer pipe)	16mm-110mm	Symmetrical	Additional 450mm wrap of insulation around the pipe on the underside of the deck	S1570292
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	90mm-315mm	Symmetrical	Sleeve insulation plus insulation to cover the edge of the seal on the underside of the deck	S1570292

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 7. RS- PPS/S series A-60 penetrations in Steel bulkheads

Steel Bulkheads A-60				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Details	Insulation Details for A-60	Drawing Reference
PE/HDPE	16mm-110mm	Symmetrical	No additional insulation required	S1570748
PP/PPR/PPML/PPFR	16mm-110mm	Symmetrical	No additional insulation required	S1570748
PE-AL-PE (multi-layer pipe)	16mm-63mm	Symmetrical	150mm ring around the penetration on the insulated side	S1570768
Pre-insulated plastic bundle pipes (with outer insulated jacket passing through fire collar/seal)	67mm-96mm	Symmetrical	No additional insulation required	S1570768
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	75mm-110mm	Symmetrical	150mm ring around the penetration on the insulated side	S1570768

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 8. RS-PPS/S series A-60 penetrations in Steel Decks

Steel Decks A-60				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Details	Insulation Details for A-60	Drawing Reference
ABS	16mm-110mm	Symmetrical	No additional insulation required	S1570748
PE/HDPE	16mm-110mm	Symmetrical	No additional insulation required	S1570748
PP/PPR/PPML/PPFR	16mm-110mm	Symmetrical	No additional insulation required	S1570748
PVC (inc uPVC & cPVC)	16mm-114mm	Symmetrical	150mm ring around the pipe on the underside of the deck	S1570748
PE-AL-PE (multi-layer pipe)	16mm-32mm	Symmetrical plus above & below deck	No additional insulation required	S1570768
	33mm - 75mm	Symmetrical	Additional 200mm wrap of insulation around the pipe on the underside of the deck	S1570768
Pre-insulated plastic bundle pipes (with outer insulated jacket passing through fire collar/seal)	75mm-110mm	Symmetrical	No additional insulation required	S1570768

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 9. RS- PPS/S series A-0 penetrations in Steel bulkheads

Steel Bulkheads A-0				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Details	Insulation Details for A-0	Drawing Reference
PE/HDPE	16mm-110mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve	S1571336
PP/PPR/PPML/PPFR	16mm-63mm	Symmetrical	No additional insulation required	S1571336
	64mm-110mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve	S1571336
PE-AL-PE (multi-layer pipe)	16mm-63mm	Symmetrical	Additional 200mm and 150mm rings of insulation are to be installed around the sleeve	S1571354
Pre-insulated plastic bundle pipes (with outer insulated jacket passing through fire collar/seal)	67mm-96mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve	S1571354
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	75mm-110mm	Symmetrical	Additional 200mm and 150mm rings of insulation are to be installed around the sleeve	S1571354

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 10. RS-PPS/S series A-0 penetrations in Steel Decks

Steel Decks A-0				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Details	Insulation Details for A-0	Drawing Reference
ABS	16mm-110mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the pipe on the underside of the deck	S1571336
PE/HDPE	16mm-110mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the pipe on the underside of the deck	S1571336
PP/PPR/PPML/PPFR	16mm-110mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the pipe on the underside of the deck	S1571336
PVC (inc uPVC & cPVC)	16mm-114mm	Symmetrical	Additional 200mm and 150mm rings of insulation are to be installed around the sleeve and pipe on the underside of the deck	S1571336
PE-AL-PE (multi-layer pipe)	16mm-32mm	Symmetrical plus above & below deck	An additional 200mm ring of insulation is to be installed around the sleeve on the underside of the deck	S1571354
	33mm - 75mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve on the underside of the deck plus an additional 200mm wrap of insulation around the pipe	S1571354
Pre-insulated plastic bundle pipes (with outer insulated jacket passing through fire collar/seal)	75mm-110mm	Symmetrical	An additional 200mm ring of insulation is to be installed around the sleeve on the underside of the deck	S1571354

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 11. RS-PPS/S series A-Class penetrations in Aluminium Bulkheads (A-0 and A-60)

Aluminium Bulkheads A-0 and A-60				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Details	Insulation Details for A-0 and A-60	Drawing Reference
PP/PPR/PPML/PPFR	16mm-110mm	Symmetrical	No additional insulation required	S1570774
PE/HDPE	16mm-110mm	Symmetrical	No additional insulation required	S1570774
PE-AL-PE (multi-layer pipe)	16mm-63mm (A-60)	Symmetrical	Additional wrap of insulation around the pipe. Complete length of insulation from the structure to equal 250mm : see insulation drawing	S1570774
PE-AL-PE (multi-layer pipe)	16mm-75mm (A-0)	Symmetrical	No additional insulation required	S1570774
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	75mm-110mm	Symmetrical	No additional insulation required	S1570774

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

Table 12. RS-PPS/S series A-Class penetrations in Aluminium Decks (A-0 and A-60)

Aluminium Decks A-0 and A-60				
Pipe Material	Max Pipe O.D. range (mm)	Collar Installation Details	Insulation Details for A-0 and A-60	Drawing Reference
PP/PPR/PPML/PPFR	16mm-110mm	Symmetrical	No additional insulation required	S1570774
PE/HDPE	16mm-110mm	Symmetrical	No additional insulation required	S1570774
PE-AL-PE (multi-layer pipe)	16mm-63mm	Symmetrical	Additional wrap of insulation around the pipe on the underside of the deck. Complete length of insulation from the structure to equal 250mm : see insulation drawing	S1570774
Pre-insulated thermoplastic pipes (OD - including outer shell / jacket)	75mm-110mm	Symmetrical	No additional insulation required	S1570774

NOTES

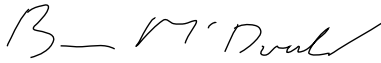
1. Penetrations underwent a hydrostatic pressure test of 6 bar and pneumatic pressure test of 4 bar, for a period of 30 minutes without leakage, as detailed in testing witness reports SKM-04-4088 and MLM010247 and MLM020133.

DESIGN APPRAISAL DOCUMENT

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21431832SF-01

PLACE OF PRODUCTION

Roxtec International AB
Box 540
S-371 23 Karlskrona
Sweden



Bruce McDonald
Technical Authority-Statutory
Lloyd's Register Americas

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).