

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 GmbH
Address	Neuer Höltingbaum 1-3, Hamburg, 22143, Germany
Type	CABLE AND PIPE PENETRATION (STANDARD FIRE TEST)
Description	GK Packing system, modular and rectangular penetrations type: "SPK/EMC-SPR"
Trade Name	"SPK/EMC-SPR"
Specified Standard	IMO Res. MSC.307 (88)-(2010 FTP Code) Annex 1 Part 3 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 IMO MSC.1/Circ.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.

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

Bruce McDonald

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

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DESIGN APPRAISAL DOCUMENT

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR2253327SF-02

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 a an Amendment of Certificate Number LR2253327SF

TEST REPORTS

SP Technical Research Institute of Sweden, test report numbers 4P00576 dated 7th May 2014, 4P00572 dated 6th May 2014.

DMT _ Test Laboratory for Fire Protection, Lathen Germany, test Report numbers DMT-DO-53-112 dated, 22nd May 2019, DMT-DO-53-111 dated 27th March 2019, DMT-DO-53-099 dated 21th January 2019, DMT-DO-53-110 dated 27th March 2019, DMT-DO-53-103 dated 27th February 2019, DMT-DO-53-104 dated 26th February 2019, DMT-DO-53-100 dated 24th January 2019.

TUV Nord Laboratory Hamburg Germany, test report GV05/4113.2 dated 26th January 2005, GV09/6415 15th June 2009.

DBI Danish Institute of Fire and Security Technology, test report numbers PGA10568 dated 4th March 2015, PGA10517 dated 20th November 2014, PGA10569 dated 4th March 2015, PGA 10518 20th November 2014, PGA11387A dated 5th July 2019,

Ship Design and Research Centre Gdansk Poland, Test report numbers RS-19/B-017/E dated 27th May 2019, RS-19/B-224/E dated 1st August 2019, RS-19/B-019/E dated 27th May 2019, RS-19/B-020/E dated 27th May 2019, RS-19/B-018/E dated 17th June 2019, RS-19/B-225/E dated 1st August 2019.

Pressure Witness statements reference GK20190424 dated 24th April 2019, GK20190516 dated 16th May 2019, GK20190606 dated 6th June 2019, GK20190730 dated 30th July 2019, GK20190815 dated 15th August 2019 , HBG0200283-1 dated 17th October 2002.

INSTALLATION DOCUMENTATION

The installation and insulation of the GK-Packing System is to is to be done in accordance with actual version of manufacturer's welding, mounting and insulation instructions listed below:

- GK_Welding_Instruction_Steel&Alu, from October 2018 or newer
- GK_SPK_Mounting_Instruction, from December 2019 or newer
- GK_EMV-SPR-RM_Mounting_Instruction, from January 2015 or newer
- GK Transit system drawings reference;

Z2019001 - Cable Rectangular A-60 Steel B & D, Rev. A

Z2019003 - Cable Rectangular A-60 Alu B & D, Rev. A

Z2019005 - Steel Pipe Rectangular A-60 Steel B & D, Rev. A

Z2019007 - Copper Pipe Rectangular A-60 Steel B & D, Rev. A

Z2019009 - Steel Pipe Rectangular A-60 Alu B & D, Rev. A

Z2019011 - Copper Pipe Rectangular A-60 Alu B & D, Rev. A

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Z2019016 - Cable Rectangular A-0 Steel B & D, Rev. A
Z2019019 - Blind Cover BD Rectangular A-60 Steel B & D, Rev. A
Z2019020 - Blind Cover BD Rectangular A-60 Alu B & D, Rev. A
Z2019030 - Routing Combination Frames A-60 Steel B & D, Rev. A
Z2019031 - Routing Combination Frames A-60 Alu B & D, Rev. A
Z2019032 - Routing BTB Frames A-Class Steel B & D, Rev. A
Z2019033 - Routing BTB Frames A-Class Alu B & D, Rev. A

CONDITIONS OF CERTIFICATION

1. GK Packing System for, for rectangular solutions, for cable and pipe- transits in A Class steel and aluminium bulkheads and decks. GK-SPK/ SPKh system consisting of rectangular shaped frames, compression-wedge, standard modular cable and pipe filling modules, accessories and metal/plastic anchor plates. GK-EMC-SPR system consisting of frame with compression-screw, EMC modular cable and/or filling modules, accessories and metal anchor plates. Module System length: GK-SPK/ SPKh is 60mm; GK-EMC-SPR is 80mm.
2. Approved for maximum diameter cables of 88 mm and maximum diameter metal bundle pipe of 29 mm. Modules can be provide with no cables/pipes (i.e. blank module) to multiple pipes/cables with a pipe/cable in each module.
3. For applications in steel A-0, A-15 or A-30 Class steel bulkheads and decks, a 200mm diameter collar of insulation must be added to bring the insulation collar up to A-60 penetration. For A-0 penetrations which have been tested without insulation additional ring of insulation is not required. Please refer to manufacturer's drawings for details.
4. Packing modules: Halogen-free (green colour) cable and pipe modules, filling modules and accessories (Standard 3-Rib). GK-SPK-Frames may also be fitted with Roxtec international (blue) modules, compressions system and stay plates, however mixing of GK-components and Roxtec-Modules in one frame is not permitted.

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5. Table 1 below details frame sizes

Table 1. Details of GK packing system frame type

GK Packing system	Frame Type	Frame Sizes	Fixing Method
GK-SPK (rectangular shape)	SPK	Single and group frames in nominal sizes 2, 4, 6 and 8 with chamber width of 60mm and 120mm.	Welded
	SPK-F		Bolted and Welded
	SPK-S30		Welded
	SPK-S50		Welded
	SPK-F-R		Bolted and Welded
	SPK BTB		Welded
GK-SPKh (oval shape)	SPKh-120	Single and group frames in nominal sizes 2, 4, 6 and 8 with chamber width of 120mm and 180mm.	Welded
	SPKh-180		
	SPKh-BTB		
GK-EMC-SPR (rectangular shape)	EMC-SPR	Single and group frames in nominal sizes 2, 4, 6 and 8 with chamber width of 60mm and 120mm.	Welded
	EMC-SPR-S50		
	EMC-SPR-50		
	EMC-SPR-F		Bolted and Welded
	EMC-SPR-BTB		Welded

6. Tables 2 and 3 below give maximum frame sizes for steel and aluminum divisions.

Table 2. GK Packing system in Steel divisions

GK Packing system	Fire Rating	Maximum Combination Frame Sizes
GK-SPK	A-0 Steel Bulkhead	SPK-8+8x3
	A-0 Steel Deck	SPK-8+8x3
	A-60 Steel Bulkhead	SPK-8+8X10
	A-60 Steel Deck	SPK-8+8X6
GK-EMC-SPR	A-0 Steel Bulkhead	EMC-SPR 8+8x3
	A-0 Steel Deck	EMC-SPR 8+8x3
	A-60 Steel Bulkhead	EMC-SPR 8+8x10
	A-60 Steel Deck	EMC-SPR 8+8x6

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Table 3. GK Packing system in Aluminum divisions

GK Packing system	Fire Rating	Maximum Combination Frame Sizes
GK-SPK	A-60 Aluminium Bulkhead	SPK-8+8X10
	A-60 Aluminium Deck	SPK-8+8X6
GK-EMC-SPR	A-60 Aluminium Bulkhead	EMC-SPR 8+8x10
	A-60 Aluminium Deck	EMC-SPR 8+8x6

7. Table 4 below details maximum pipe sizes for penetrations

Table 4. Maximum Pipe sizes for penetrations

Pipe Material	Frame Type	Outer Diameter
Carbon, Stainless Steel and Copper	SPK,SPK-F, SPK-S30, SPK-S50, SPK-F-R, SPK-BTB, SPKh-120, SPKh-180, EMC-SPR, EMC-SPR-S50, EMC-SPR-50, SMC-SPR-F	6-108mm
Bundle Pipe	SPK,SPK-F, SPK-S30, SPK-S50, SPK-F-R, SPK-BTB, SPKh-120, SPKh-180, EMC-SPR, EMC-SPR-S50, EMC-SPR-50, EMC-SPR-F	Max 29mm

8. Table 5 gives details of hydrostatic and pneumatic testing carried out.

Table 5. Pneumatic and hydrostatic pressure ratings

GK Packing System	Water Test Pressure	Gas Test Pressure (Air)
GK-SPK (with metal stay plates)	3.8 bar	0.3 bar
GK-EMC-SPR (with metal stay plates)	3.8 bar	0.3 bar

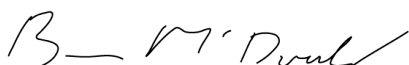
9. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype.
10. The certificate holder is solely responsible for the products supplied under this Certificate and to ensure that 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.

DESIGN APPRAISAL DOCUMENT

Reference: UKITSO/FIRE/TA/BM/WP36841714/PRJ1110021496

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR2253327SF-02**PLACE OF PRODUCTION**

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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).

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