



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAF00001AR
Revision No:
1

This is to certify:

that the **Class A and B Penetration**

with type designation(s)

GK Packing System with fix diameter sealing technology: SPK/SPR and RM-series (for steel divisions)

issued to

Roxtec GmbH
Hamburg, Germany

is found to comply with

DNV rules for classification – Ships

DNV offshore standards

DNV class programme DNV-CP-0165 – Type approval – Cable and pipe penetrations

Application:

Approved for use as cable penetration system for ship cables in class A-60 and A-0 steel bulkheads and decks.

For further details see Application/Limitations on page 3 of this certificate.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2024-09-12**

for **DNV**

This Certificate is valid until **2029-09-11**.

DNV local unit: **Hamburg**

Approval Engineer: **Carsten Hunsalz**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

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Product description

GK sealing system consisting of rectangular or circular shaped metal frame filled with halogen-free sealing modules with fix-diameter technology for cable-transits in A-0 and A-60 Class STEEL Bulkhead and Deck divisions.

Rectangular shape:

SPK Series (SPK, SPKh, EMC-SPK, EMC-SPKh), consisting of a rectangular shaped metal frame with outside radii 10-100mm, available in nominal sizes 2-8 and chamber-width(s) 60-180mm. Frames available as single-chamber or multi-chamber variants with or without flange and are either welded or bolted to the metal division. The frames are filled with standard or EMC fix-diameter sealing modules, filling modules, stay-plates (plastic or metal), accessories and a wedge seal, which compresses the complete sealing arrangement inside the metal frame, thus closing the cable-transit with its intended properties. Standard System depth is 60mm and EMC System depth is 80mm.

EMC-SPR Series (EMC-SPR, EMC-SPR-S50, EMC-SPR-50), consisting of a rectangular shaped metal frame with outside radii 10-100mm, available in nominal sizes 2-8 and chamber-width(s) 60-180mm. Frames available as single-chamber or multi-chamber variants with or without flange and are either welded or bolted to the metal division. The frames are filled with EMC fix-diameter sealing modules, filling modules, stay-plates (metal) and accessories. The complete sealing arrangement inside the metal frame is compressed using the compression unit incorporated in the frame, thus closing the cable-transit with its intended properties. EMC System depth is 80mm.

Circular shape:

RM Series (SLEEVES Type SLRM, SLRM-RED and EMC-SLRM, EMC SLRM-RED), consisting of a metal sleeve with an elastomer Round Module type RM-Frame insert, which provides a square packing space and an incorporated compression function. Sleeves with RM-Frames are available in nominal sizes 50-200 (SLRM-RED up to size 100) and are either welded or bolted to the steel division. The square packing space of the RM-Frame insert is filled with standard or EMC fix-diameter sealing modules and filling modules and is compressed using the incorporated compression mechanism, thus closing the cable-transit with its intended properties. Standard System depth is 60mm and EMC System depth is 80mm.

Approved Frame Types

GK Sealing System	Frame Type	Frame Sizes	Fixing Method
GK-Type "SPK" (rectangular shape) Outside radii R=10 - 100mm	SPK SPK-R SPK-S30 SPK-S50	Single and group frames in nominal sizes 2, 4, 6 and 8 with chamber width(s) of 60mm, 120 and 180mm. Frames with or without flange in different combinations incl. Back-to-Back *)	Welded or bolted (flange only)
GK-Type "SPKh" (rectangular shape) Outside radii R=70 - 100mm	SPKh-120 SPKh-180	Single frames in nominal sizes 2, 4, 6 and 8 with chamber width(s) of 120mm and 180mm. Frames available with or without flange incl. Back-to-Back *)	Welded or bolted (flange only)
GK-Type "RM" (circular shape)	SLRM	Sleeves with RM-Frame in nominal sizes 50, 70, 100, 125, 150 and 200, with or without flange incl. Back-to-Back *)	Welded or bolted (flange only)
GK-Type "SLRM-RED" (circular shape)	SLRM-RED	Reduced sleeves with RM-Frame in nominal sizes 50, 70, 100 for reduced cutout dimension and retrofit installations	Welded or bolted
GK-Type „EMC-SPR“ (rectangular shape) Outside radii R=10 - 50 mm	EMC-SPR EMC-SPR-S50 EMC-SPR-50	Single and group frames in nominal sizes 2, 4, 6 and 8 with chamber width(s) of 60mm, 120 and 180mm. Frames available with or without flange in different combinations incl. Back-to-Back *)	Welded or bolted (flange only)
GK-Type "EMC-SPK" (rectangular shape) Outside radii R=10 - 100mm	EMC-SPK EMC-SPK-S30 EMC-SPK-S50	Single and group frames in nominal sizes 2, 4, 6 and 8 with chamber width(s) of 120mm. Frames available with or without flange in different combinations incl. Back-to-Back *)	Welded or bolted (flange only)

GK-Type "EMC-SPKh" (rectangular shape) Outside radii R=70mm	EMC-SPKh-120	Single frames in nominal sizes 2, 4, 6 and 8 with chamber width of 120mm. Frames available with or without flange incl. Back-to-Back *)	Welded or bolted (flange only)
GK-Type "EMC-RM" (circular shape)	EMC-SLRM	Sleeves with RM-Frame in nominal sizes 50, 70, 100, 125, 150 and 200 available with or without flange incl. Back-to-Back *)	Welded or bolted (flange only)
GK-Type "EMC-SLRM-RED" (circular shape)	EMC-SLRM-RED	Reduced sleeves with RM-Frame in nominal sizes 50, 70, 100 for reduced cutout dimension and retrofit installations.	Welded or bolted

*) Recommended test procedures see Doc. GK20231114001

Minimum sleeves length and wall thickness for GK-Type "RM": Standard System L ≥ 65mm and S ≥ 4mm.

EMC System L ≥ 85mm and S ≥ 4mm.

Approved Blank Covers

Frame types SPK, SPK-F, SPK-S30, SPK-S50 and SPK-F-R can be closed using blank covers of type GK-BD when empty in non-watertight bulkhead and deck applications.

Approved Packing Modules

Halogen-free (green) fix diameter modules, filling modules and accessories (Standard 3-Rib or EMC). Frames GK-Type "SPK" may also be fitted with Roxtec RM modules with Multidiameter™, accessory modules, compressions system and stay plates, however mixing of GK-components and Roxtec-Modules in one opening is not permitted.

Approved Maximum Frame Sizes

GK-Packing System	Fire Rating	Maximum Combination Frame Size
GK-Type "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-Type "EMC-SPR" / "EMC-SPK"	A-0 Steel Bulkhead	EMC-SPR/SPK-8+8x3
	A-0 Steel Deck	EMC-SPR/SPK-8+8x3
	A-60 Steel Bulkhead	EMC-SPR/SPK-8+8x10
	A-60 Steel Deck	EMC-SPR/SPK-8+8x6

Application/Limitation

Approved for use as cable penetration system in class A-0 (in most cases without insulation) and A-60 steel bulkheads and decks. Approved for use in A-15 and A-30 division, the penetration system is to be insulated as for class A-60, and in addition the division shall be insulated at least 200 mm around the penetration. Other applications are subject to case-by-case approval.

The insulation material shall be of approved type.

Approved for air tightness

GK-Type SPK, SPKh (with metal stay-plates) and EMC-SPR, EMC-SPK and EMC-SPKh-120 (with metal stay-plates) and GK-Type RM as well as EMC-RM (incl. SLRM-RED and EMC-SLRM-RED) up to a design pressure of 0.02 MPa (0.2 bar), test pressure - 0.03 MPa (0.3bar)

Approved for water tightness

GK-Type SPK, SPKh (with metal stay-plates) and EMC-SPR, EMC-SPK and EMC-SPKh-120 (with metal stay-plates) up to a design pressure of 0.25 MPa (2.5 bar), test pressure - 0.38 MPa (3.8 bar)

GK-Type RM and EMC-RM size 50 – 150 (incl. SLRM-RED and EMC-SLRM-RED)
up to a design pressure of 0.2 MPa (2 bar), test pressure - 0.3 MPa (3 bar)

GK-RM and GK-EMC-RM size 200
up to a design pressure of 0.13 MPa (1.3 bar), test pressure - 0.2 MPa (2 bar)

Minimum Filling Rate 0%: no cable installed - all modules are empty.
Maximum Filling Rate 100%: multiple cables installed - cable installed in every module.

Approved for maximum diameter: Cables 88 mm, metal bundle pipes 29 mm.
Penetration systems are not to be used for penetrating boundaries of tanks, the use in dry void spaces is applicable.

Each product is to be supplied with its manual for installation and use.

Installation of all GK Packing Systems components is to be done in accordance with actual version of manufacturer's welding, mounting and insulation instructions listed below.

Type Approval documentation

Test Reports Fire Class:

DMT-DO-53-099 dated 2019-01-24, DMT-DO-53-100 dated 2019-01-24, DMT-DO-53-103 dated 2019-02-27, DMT-DO-53-104 dated 2019-02-26, DMT-DO-53-110 dated 2019-03-27, DMT-DO-53-111 dated 2019-03-27, DMT-DO-53-112 dated 2019-05-22,

PGA10517 dated 2014-11-20, PGA10518 dated 2014-11-20, PGA10568 dated 2015-03-04, PGA10569 dated 2015-03-04, PGA11387A dated 2019-07-05, PGA11388A dated 2019-08-14

RS-19/B-017/E dated 2019-05-27, RS-19/B-018/E dated 2019-06-17, RS-19/B-019/E dated 2019-05-27, RS-19/B-020/E dated 2019-05-27, RS-19/B-224/E dated 2019-08-01, RS-19/B-225/E dated 2019-08-01,

GV 09/6415 dated 2009-06-15, GV05/4113.1 dated 2005-02-11, GV05/4113.2 dated 2005-02-11, GV05/4237.1 dated 2005-04-28, 4P06068 dated 2015-01-17, 4P00572 dated 2014-05-06, 4P00576 dated 2014-05-07, 4P07023 dated 2015-02-04, N141TXUX dated 2019-07-05, N141UMGR dated 2019-07-16, N141UMHA dated 2019-07-16, RS-23/B-106/E dated 2023-05-23.

Installation

The installation and insulation of the GK-Packing System is to be carried out according to the following manufacturer's welding, mounting and insulation instructions:

Welding & Mounting Instructions

GK-WELD-RECOMMENDATION_ST-AL_SEP2019 (or newer)
GK-INSTRUCTION_SPK_JAN2020 (or newer)
GK-INSTRUCTION_RM_JAN2020 (or newer)
GK-INSTRUCTION_BD_SPK_JUN2024 (or newer)
GK-INSTRUCTION EMC-SPRRM_EN_JAN2020 (or newer)
GK-INSTRUCTION EMC-SPK_EN_APR2024 (or newer)
GK-TEST-RECOMMENDATION_SPK-BTB_NOV2023 (Doc. GK20231114001) (or newer)

Insulation Instruction (STEEL Bulkhead and Deck)

Drawing Titel	Drawing Number	GK Transit Type (partly incl. Back-to-Back)
Cable Rectangular A-0	Z2019016 Rev.B	SPK/SPKh and EMC SPK/SPKh and EMC SPR
Cable Circular A-0	Z2019017 Rev.B	SLRM/EMC SLRM and SLRM-RED/EMC SLRM-RED
Cable Circular SLRM-RED A-0	Z2019018 Rev.B	SLRM-RED/EMC SLRM-RED
Cable Rectangular A-60	Z2019001 Rev.B	SPK/SPKh and EMC SPK/SPKh and EMC SPR
Cable Circular A-60	Z2019002 Rev.B	SLRM/EMC SLRM and SLRM-RED/EMC SLRM-RED
Blind Cover BD Rectangular A-60	Z2019019 Rev.B	SPK sizes 4, 6, 8
Routing Combination Frames A-CLASS	Z2019030 Rev.B	SPK/EMC SPK and EMC SPR
Routing BTB Frames A-CLASS	Z2019032 Rev.B	SPK/ RM and EMC SPK/ EMC RM and EMC SPR

(use Revision B or newer)

Pressure tests: Documents no. GK 20190815 dated 2019-08-15, GK 20190730 dated 2019-07-30, GK 20190606 dated 2019-06-06, GK 20190526 dated 2019-05-16, GK 20190424 dated 2019-04-24, HBG 0200283-1, ID 2023-07-26_PressureTestArrangement_EMC SPK-S50 8x1_Empty_H=253,5, ID 2023-07-26_PressureTestArrangement_EMC SPK-S50 8x1_Cable_H=254,5, ID 2023-07-26_PressureTestArrangement_EMC SPKh-120 8x1_Empty_H=254,5

Tests carried out

Fire Test acc. 2010 FTP Code, Annex 1: Part 3, IMO Resolution MSC.307(88)
Pressure tests according to DNV-CP-0165 Sec. 2 Ch. 4.

Marking of product

The product or packing is to be marked with name of manufacturer, type designation and fire-technical rating.

Periodical assessment

DNV's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in DNV-CP-0338 Section 4.

END OF CERTIFICATE