TYPE APPROVAL CERTIFICATE
No. **MAC246016XG/003**

This is to certify that the product identified below is in compliance with the regulations herewith specified.

Description	**Metallic flexible hoses**
Type	**SE and SZ**
Applicant	**HKS GMBH** **SCHONENFAHRERSTR 1** **18057 Rostock** **GERMANY**
Manufacturer	**HKS GMBH**
Place of manufacture	**SCHONENFAHRERSTR 1** **18057 Rostock** **GERMANY**
Reference standards	**Part C, Chapter 1, Appendix 7 (Gas Fuelled Ship) RINA Rules ; Part E Chapter 9 Section 9 (Liquified Gas Carrier) RINA Rules; IGF Code as per IMO MSC.391(95); IGC Code as last amended by IMO MSC.377(93), ; Part C, Chapter 1, Section 10 of RINA Rules; DIN 3384:2007**

Issued in **HAMBURG** on **November 13, 2017**. *This Certificate is valid until* **November 12, 2022**

RINA Services S.p.A.
Giuseppe Russo

This certificate consists of this page and 1 enclosure

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SE and SZ

Reference documents
- Drawings approved with HMMC-8638 and HMMC-8885 with Letter HMMC/2017/00191/CRLVA
- Test reports no. TUV Sud report : ar76245913_02, DVGW - NG-4602CL0260, DVGW 07-0455-GN

Components/Materials
Stainless Steel 1.4404 (AISI 316L), 1.4541 (AISI 321) for hose
Stainless Steel 1.4301 (AISI 304) for end fittings

Design Conditions
Design Temperature: -20°C up to +125°C
Design Pressure: 12 bar
Design Cycle : 3000
Nominal Diameter: DN 15 up to DN 100

The allowable movements and design parameters are depending on type and material of expansion joints (see approved drawings above mentioned).

Fields of application
The hoses are not double walled and they may be used only in gas fuel piping system in hazardous spaces..

Alternative Manufacturer
HKS-CZ s.r.o.
Meldkojedska 1994/7
41201 Litomerice
Czech Republic

Acceptance conditions
- The installation on board is to be made in accordance with the Manufacturer's instructions and provisions stated in Part C Chapter 1 Section 10 par. 2,6 of RINA Rules.
- The flanges shall be suitable for the actual design pressure and temperature of on board system
- The hoses are to be marked with type designation manufacturer's name and maximum working pressure.

For gas fuelled ships the following IGF Code (IMO Resolution MSC.391(95)) and RINA Rules requirements are applicable:

- Material testing in accordance with Table 7.1 – 7.4
- Welding procedure tests in accordance with 16.3.3.4
- Tests on board as per 16.7.3.2 and 16.7.3.5
- Production Test in accordance with Part C Chapter 1 Appendix 7 par. 16.7.3 of RINA Rules

For liquefied gas carrier the following IGC code (as last amended by IMO Resolution MSC.377(93) and RINA Rules requirements are applicable:

- Material Testing in accordance with Table 6.4
- Welding procedure tests in accordance with 6.3.5
- Production Test in accordance with Part E Chapter 9 Section 5 of RINA Rules.

HAMBURG March 28, 2017

[redacted]