



## TYPE APPROVAL CERTIFICATE

No. MAC035117XG/003

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

<i>Description</i>	<b>Metallic expansion joints</b>
<i>Type</i>	<b>AD</b>
<i>Applicant</i>	<b>HKS GMBH SCHONENFAHRERSTR 1 18057 Rostock GERMANY</b>
<i>Manufacturer</i>	<b>HKS GMBH</b>
<i>Place of manufacture</i>	<b>SCHONENFAHRERSTR 1 18057 Rostock GERMANY</b>
<i>Reference standards</i>	<b>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); British Standard BS-6364:1984</b>

Issued in **HAMBURG** on **March 28, 2017**. This Certificate is valid until **March 27, 2022**

RINA Services S.p.A.  
**Giuseppe Russo**

This certificate consists of this page and 1 enclosure



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AD**

**Reference documents**

Drawing Approved HMMC-8777 with letter HMMC/2017/00255/CRLVA

Type Test Report filed with HMMC-8785

HKS Test Record : 19633 , 18838 , 6972

SVUM Low Cycle Fatigue test Report N° 1530 253

**Components/Materials**

As per above mentioned approved drawings

**Design Conditions**

DN	Design Pressure : bar	Temperature Range
100	10	0° - 60°
125	10	0° - 60°

**Fields of application**

As per above mentioned approved drawings

**Acceptance conditions**

- The installation on board is to be made in accordance with the Manufacturer's instructions and provisions stated in RINA Rules.
- The flanges shall be suitable for the actual design pressure and temperature of on board system
- Expansion Joints are to be marked with type designation manufacturer's name and maximum working pressure.
- The double-wall expansion joint may be used for fuel gas application.
- The air space between the gas pipe and the double-wall is to be provided with a mechanical exhaust ventilation system and a continuous gas detection in accordance with the applicable rules.
- Electrical equipment located in the air space in 4.3 above is to be of a suitable safe type complying with the applicable rules.
- In case of high level of vibrations in the piping systems, care shall be taken in order to avoid that the natural frequency of bellows doesn't coincide with the system frequency.
- In all cases, the associated pipelines are to be suitably aligned, supported and anchored. The expansion joints are to be at any time accessible, well visible and protected against over extension and compression and against mechanical damage.

**HAMBURG March 7, 2017**

