Certificate No:
TAP00002HF

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Metallic Expansion Joints

with type designation(s)
Single, Universal

Issued to
Nippon Metal Hose Co., Ltd.
Ohi-gun, Fukui Pref., Japan

is found to comply with
DNV rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers

Application :

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

Type:	Temperature range:	Max. working press.:	Sizes:
Single	0°C/80°C	10 bar	150A
Universal	0°C/150°C	12 bar	80A

Issued at **Høvik** on **2022-04-01**
This Certificate is valid until **2027-03-31**.
DNV local station: **Kobe**

Approval Engineer: **Thomas Wilhelm Juell**

for **DNV**

Zeinab Sharifi
Head of Section

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.

Product description

One single and one universal reinforced metallic expansion bellows designed according to EJMA 10th edition with flange and internal sleeve:

Size	Code	Internal Diameter	Pitch	Height	Ply x thk.	Convolutions
150A	M-32529	163 mm	40 mm	34 mm	1 x 1 mm	6
80A	M-32531	86.6 mm	23 mm	20 mm	2 x 0.6 mm	2 x 4

Material:

Bellow and internal sleeve:	SUS304
Reinforcement ring:	SUS304TP
Pipe:	STPG370
Flange:	SS400 according to JIS10K

Application/Limitation

Expansion bellows covered by this certificate are found to be in compliance with the given design standard and may be installed in fuel oil/gas system.

Size	Code	Movement			Lifetime	Design Pressure
		Axial	Lateral	Angular		
150A	M-32529	-24.6 mm	5.6851 mm	0°	2000 cycles	10 bar
80A	M-32531	-25.1 mm	6.6573 mm	0°	2000 cycles	12 bar

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions. Bellows of austenitic stainless steel shall not be used in direct contact with seawater.

Ship deformation loads has not been considered.

Welding shall fulfill requirements in DNV Rules Pt.2 Ch.4.

The installation shall be done according to type approval holder's procedures.

Production testing

Each expansion bellow shall be subjected to hydrostatic pressure test upon completion to at least 1.5 times the design pressure.

Certification

Material of bellows shall have material certificates in accordance with DNV-RU-SHIP Pt.5 Ch.7 Sec.1 Table 8. All materials delivered with VL or works certificate shall be made at works approved by the Society.

Expansion Bellows covered by this certificate shall be delivered with a product certificate issued by the society.

Type Approval documentation

Tests carried out

Pressure test, burst test, and cyclic test (thermal movement).

Marking of product

For traceability to this type approval, the compensators are to be marked with:

- Manufacturer's trade mark
- Type designation (as stated in the submitted drawings)
- Size
- Maximum working pressure
- Temperature range
- The flow direction, if applicable

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNV-CP-0338.