DNV·GL

Certificate No:
TAP0000245

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Metallic Expansion Joints

with type designation(s)
Single Bellows

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

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

Application :

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

Temperature range:	**0 ºC to 290 ºC (see page 2)**
Max. working press.:	**4 bar / 5.69 bar**
Sizes:	**200A, 250A and 450A**

Issued at **Høvik** on **2020-07-08**

This Certificate is valid until **2023-12-31**.

for **DNV GL**

DNV GL local station: **Kobe**

Approval Engineer: **Adel Samiei**

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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.

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Job Id: **262.1-009249-4**
Certificate No: **TAP0000245**

Product description

Three single ply metallic expansion joints (single type made of SUS304)) designed according to EJMA 9th Edition, reinforced with steel rings (SUS304) and with permanently fitted flanges (SS400)

Size	Number of Convolutions	Thickness of ply	Pitch (q)	Width (w)
200A / 250 A	3	1.0 mm	46 mm	50 mm
450A	4	1.5 mm	46 mm	50 mm

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, lubrication oil, flammable hydraulic oil, steam, compressed air and freshwater systems and in below design conditions:

Design Conditions	**200A**	**250A**	**450A**
Design Pressure (bar)	4	4	5.69
Maximum Design Temperature(°C)	50	50	290
Axial Movement(mm)	±5	±5	-10
Lateral Movement (mm)	2	2	5
Angular movement (°)	0	0	0
Life cycles	40200	93800	3200
Allowable flow velocity (liquid) (m/s)	3.0480		
Allowable flow velocity (gas) (m/s)	7.3152		

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

Whenever the piping system is subject to approval by the society, the below limitations shall be considered:

- Bellows covered by this certificate shall be delivered with test report with reference to this type approval certificate (see to DNVGL-RU-SHIP Pt.4 Ch.6 Sec.1 Table 4).
- Welding shall fulfill requirements in DNVGL-RU-SHIP Pt.2 Ch.4.
- Material of bellow shall have material certificates in accordance with DNVGL-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for VL or W material certificates.

Type Approval documentation

Marking of product

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

- Manufacturer's trademark
- 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 GL 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 DNVGL-CP-0338.