



Certificate No:
TAP00002MN

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Metallic Expansion Joints

with type designation(s)
P195312, P195313

Issued to

Masino Industry Oy
Ylöjärvi, Finland

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:
P195312
P195313

Issued at **Høvik** on **2024-05-15**

This Certificate is valid until **2029-05-14**.

for **DNV**

DNV local unit: **Finland CMC**

Approval Engineer: **Sarah Miller**

Bosman van der Merwe
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

Two single type metallic expansion bellows with welded flanged ends, designed according to EJMA 10th edition:

Size	Code	Internal Diameter	Pitch	Height	Ply x thk.	Convolutions
DN 150	P195312	172 mm	15.2 mm	20.8 mm	5 x 0.3 mm	9
DN 400	P195313	415 mm	26.5 mm	26 mm	5 x 0.3 mm	6

Materials:

Bellows: 1.4404 according to EN 10028-7

Pipe: 1.4404 according to EN 10028-7

Flange: 1.4404 according to EN 1092-1

Application/Limitation

Expansion bellows covered by this certificate are found to be in compliance with the given design standard.

Size	Code	Movement			Life cycles
		Axial	Lateral	Angular	
DN 150	P195312	+50 mm	-	-	1000
DN 400	P195313	+50 mm	-	-	1000

Flow velocities in each bellow shall be limited as specified in EJMA 10th edition Table 4.10-1 when there is no sleeve installed.

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.

Welding shall fulfil requirements in DNV-RU-SHIP Pt.2 Ch.4.

Production test

Each expansion bellow shall be subjected to minimum hydrostatic pressure test pressure equal to 1.5 times the design pressure in the presence of a DNV surveyor.

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 NV or works certificate shall be made at works approved by the Society(AoM).

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

Type Approval documentation

Tests carried out

Burst test – Hydraulic Test - cyclic loading test – Fatigue test (ship deformation)

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



Job Id: **262.1-037448-1**
Certificate No: **TAP00002MN**

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.