

TYPE APPROVAL CERTIFICATE

Certificate no.:
TAP0000213
Revision No:
1

This is to certify:

that the **Metallic Expansion Joints**

with type designation(s)

Lateral (MFL DN-800), Angular (MFP DN-800), Axial + Lateral (MFD DN-2324)

issued to

MACOGA, S.A.

Órdenes, La Coruña, Spain

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems

Application:

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

Type:	Temperature range:	Max. working press.:	Sizes:
Lateral (MFL DN-800)	+20°C to +230°C	1 bar / FV	32"
Angular (MFP DN-800)	+20°C to +230°C	1 bar / FV	32"
Axial + Lateral (MFD DN-2324)	+20°C to +120°C	0.75 bar / FV	92"

Issued at **Høvik** on **2025-09-01**

This Certificate is valid until **2030-03-16**.

DNV local unit: **NB/CMC Team West**

Approval Engineer: **Marc Avice**

for **DNV**



Digitally Signed By:
Bosman van der Merwe
Location: **DNV Høvik, Norway**

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 USD 300 000.

Product description

Three metallic expansion bellows with internal sleeve designed according to EJMA 10th edition

Designation	Type	Ply & thickness	Number of convolutions	Pitch	Height
MFL DN-800	Universal	2*0.7 mm	2 x 5	25 mm	30 mm
MFP DN-800	Single	2*0.7 mm	7	25 mm	30 mm
MFD DN-2324	Universal	3*0.7 mm	2 x 7	36 mm	62 mm

Material:

Designation	Bellow	Flange	Sleeve	Pipe
MFL DN-800	AISI 321	SA516 Gr.60	AISI 304/304L	SA516 Gr.60
MFP DN-800	AISI 321	SA516 Gr.60	AISI 304/304L	SA516 Gr.60
MFD DN-2324	AISI 321	A516 Gr.70N / P355NL1	AISI 304/304L	A516 Gr.70N / P355NL1

Application/Limitation

Expansion bellows covered by this certificate are approved for use in systems conveying steam with the following design data:

Designation	Movement			Number of Cycles
	Axial	Lateral	Angular	
MFL DN-800	0	±3 mm	0	100000
MFP DN-800	0	0	±1°	
MFD DN-2324	-7.99 mm	±8.06 mm	0	

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

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 the requirements in DNV-RU-SHIP Pt.2 Ch.4.

Type Approval documentation

Drawing numbers:

- 73242 Rev.0 dated 2019-09-25
- 73241 Rev.0 dated 2019-09-25
- 73002 Rev.1 dated 2019-10-18

Calculation numbers:

- C5412R0J-ED10-MFL0800 dated 2019-07-25
- C5411R0J-ED10-MFP0800 dated 2019-07-25
- C5410R0J-ED10-MFD2324 dated 2019-10-18

Production Testing and Certification

Production Testing and Certification for the actual intended application shall follow the latest applicable edition of the Rules (as mentioned on the front page of this certificate).

Marking of product

For traceability to this type approval, the products 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



Job ID: **262.1-032746-2**
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This certificate is only valid if required periodical assessments are carried out with satisfactory results.

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.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>.

Manufactured by

Macoga, S.A.
Ordenes, La Coruña, Spain