Certificate No:
TAP00002T0

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Metallic Expansion Joints

with type designation(s)
20-4326, 20-4319

Issued to
MES Tokki & Engineering Co., Ltd.
Tamano, Okayama, **Japan**

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:
20-4326	20°C to 45°C	0.042 bar(g)	600x400
20-4319	20°C to 45°C	0.1 bar(g)	1150x500

Issued at **Høvik** on **2023-09-06**
This Certificate is valid until **2028-09-05**.
DNV local unit: **Japan CMC**

for **DNV**

Approval Engineer: **Thomas Wilhelm Juell**

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

Two single type rectangular expansion bellows designed according to EJMA 10th edition.

Size	Code	Inner diameter (mm)	Pitch (mm)	Height (mm)	Ply x thk. (mm)	Convolutions
600x400	20-4326	597x397	100	100	1 x 1.5	4
1150x500	20-4319	1147x497	100	100	1 x 1.5	4

Material:

Bellow: SUS304 (JIS G4305)
Flange & Internal sleeve: SS400 (JIS G3101)

Application/Limitation

Expansion bellows covered by this certificate are approved to be only used in systems containing combustion air.

Size	Code	Movement				Life cycles
		Axial (mm)	Lateral (Y) (mm)	Lateral (Z) (mm)	Angular (°)	
600x400	20-4326	-2.9	0	12.3	-	3000
1150x500	20-4319	-3.4	0	18.6	-	3000

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.

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 DNV-RU-SHIP Pt.4 Ch.6 Sec.1 Table 3).
- Welding shall fulfill requirements in DNV-RU-SHIP Pt.2 Ch.4.
- Material of bellow shall have material certificates in accordance with DNV-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for NV 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 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.