

TYPE APPROVAL CERTIFICATE

This is to certify:

That the **Metallic Expansion Joints**

with type designation(s)
EWE802930, EWE802931

Issued to
Tofle Co., Inc.
Hagi, Yamaguchi Pref., Japan

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021

Application :

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

Type:	Temperature range:	Max. working press.:	Sizes:
EWE802930	0 to 250°C	3.5 bar(g)	3"
EWE802931	0 to 250°C	3.5 bar(g)	4"

Issued at **Høvik** on **2021-10-15**

This Certificate is valid until **2026-10-14**.

for **DNV**

DNV local station: **Kobe**

Approval Engineer: **Maheshraja Venkatesan**

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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

Metallic expansion bellows designed according to EJMA 10th edition:

Size	Type	Pitch	Height	Ply x thk.	Convolutions
3"	EWE802930 ⁽¹⁾	10 mm	11.10 mm	1x0.4 mm	3
4"	EWE802931 ⁽¹⁾	11 mm	12.25 mm	1x0.5 mm	4

⁽¹⁾ with collar – 3 mm thickness

Material of construction:

Bellow & pipe	SUS304 / SUS321
Collar	STK 400 / STPT370-S
Flanges	SS400

Bellows are welded directly to non-standard square flanges according to manufacturer's drawings.

Application/Limitation

Expansion bellows covered by this certificate are found to be in compliance with the given design standard and may be installed in exhaust systems.

Size	Type	Movement			Lifetime	Design Pressure
		Axial	Lateral	Angular		
3"	EWE802930	+4.8 /-4.8 mm	0	0	1000 cycles	3.5 bar
3"	EWE802930	0	+0.5 /-0.5 mm	0	1000 cycles	3.5 bar
4"	EWE802931	+1.0 /-3.0 mm	0 /-0.9 mm	0	1000 cycles	3.5 bar

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 4).
- 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 MC or MD 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 DNVGL-CP-0338.