

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Metallic Expansion Joints**

with type designation(s)
Stainless steel Bellows

Issued to

MES Tokki & Engineering Co., Ltd.
Tamano OKAYAMA Pref., Japan

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

Application :

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

Temperature range: +20°C to +250°C

Max. working press.: 4.25 bar

Sizes: DN550

Issued at **Høvik** on **2017-08-21**

This Certificate is valid until **2022-08-20**.

DNV GL local station: **Kobe**

for **DNV GL**

Approval Engineer: **Adel Samiei**

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Marianne Spæren Marveng
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.



Product description

One type of metallic expansion bellow designed according to EJMA 9th edition.

Material:

Bellow: SUS304 (JIS G4305)

Flange: SS400 (JIS G3101)

Internal sleeve: SS400 (JIS G3101)

Dimensional data and approved movements according to the approved drawing.

Application/Limitation

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

Each expansion bellow shall be subjected to minimum hydrostatic test pressure equal to 1.5 times internal design pressure. Certification shall be in accordance with applicable Society's rule.

Welding shall fulfill requirements in DNV GL Rules Pt.2 Ch.4. All welding for piping components for piping classes I and II shall be carried out in an approved welding work shop by DNV GL.

Material of bellow shall have Work material certificates made by approved DNV GL manufacturers (Reference is made to DNV GL rules for classification of ships Pt.4 Ch.6 Sec.2 Table 3.)

Expansion bellows covered by this certificate are approved for 5000 load cycles.

This type approval covers the design of the product with respect to internal pressure. External loading/pipe loads have not been considered. The installation/location shall fulfil below conditions:

- 1- The installation/location of expansion joints is to be approved in each case. Piping system drawings shall be approved by DNV GL whenever expansion joints are to be installed in a ship classed by the society. The piping system design drawing(s) shall specify the location of all anchors, guides, supports, fixed points and type and location of all expansion joints.
- 2- The pipeline in which an expansion bellow shall be fitted, shall be adequately adjusted, aligned and clamped. When found necessary, protection against mechanical damage of the expansion bellows may be required. The pipeline which expansion bellows are to be fitted shall not be subject to ship deformation loads.

Type Approval documentation

Marking of product

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

- Manufacturer's name or trade mark.
- Type designation.
- Size

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform a survey - every second year and before the expiry date of this certificate - to verify that the conditions for the type approval are complied with.