

# TYPE APPROVAL CERTIFICATE

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

with type designation(s)

**YWxx 1K-I, YWxx 10K-II, YWxx 16K-III, YWxx 20K-IV, YWEF**

Issued to

**Yulwon Co.,Ltd****Paju-si, Gyeonggi-do, Republic of Korea**

is found to comply with

**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems****EJMA****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Temperature range:** -10°C to +550°C**Max. working press.:** see**Sizes:** certificateIssued at **Hamburg** on **2019-12-05**This Certificate is valid until **2024-12-04**.for **DNV GL**DNV GL local station: **Seoul**Approval Engineer: **Ana Cristina Do Carmo Insfran****Olaf Drews**  
**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

### Materials

|        | Materials <sup>1</sup> | DIN EN | ASTM      | JIS          |
|--------|------------------------|--------|-----------|--------------|
| Bellow | Stainless steel        | 1.4541 | A240 321  | SUS 321      |
|        |                        | 1.4301 | A 240 304 | SUS 304      |
| Flange | Stainless steel        | 1.4301 | A 240 304 | SUS 304      |
|        | Steel                  | 1.0039 | A36/A283  | SS400/SF440A |

Note 1

Material of bellow shall have material certificates in accordance with DNV GL Rules for Classification of Ships Pt.4 Ch.6 Sec 2 Table 3.

### Technical Data

| Medium      | Size Range (DN)   | Maximal Allow Working pressure [bar] |
|-------------|-------------------|--------------------------------------|
| Exhaust gas | 150 to 2900       | Up to 1                              |
| Steam       | 100 to 350        | 12 up to 23                          |
| Steam       | 1000              | 3.77                                 |
| Exhaust gas | ID 219 to ID 1750 | Up to 4.38                           |
|             | ID 271 to ID 634  | Up to 4.38                           |
|             | ID 65 to ID 402   | Up to 3.00                           |

## Application/Limitation

The compensators of type YWxx are type approved for application in:

Fuel, lubricating oil, hydraulic oil, bilge, fresh water cooling, compressed air, charge air, exhaust gas and steam piping systems in temperature range mentioned in the front page.

The requirements shall have in accordance with the DNV GL Rules for Classification Pt. 4 Ch. 6 Piping System Section 9 item 5.3.

For operating temperatures above 50°C the appropriate movement/pressure reduction factors of the manufacturer are to be observed.

For installation on diesel engine the calculation/prove of the relation natural frequency/main exciting frequency and the subsequent prove for the fatigue strength of the compensator must be considered separately in accordance to the requirements of the diesel engine manufacturer including resilient mounting (if applicable).

These specific properties are not covered by this type approval.

## **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**

A condition for retention of the type approval certificate in its validity period is that periodical assessments are successfully carried out. The objective of the periodical assessment is to verify that the conditions for the type approval have not been altered. Regulations for the periodical assessment of the type approval certificate are to be found in the DNVGL Class Programme CP-0338.

It is further to be noted that the Society shall be informed of any:

- Modifications to the product which are liable to affect its characteristics and functions, as originally specified and tested;
- Shifting of the production site and additional production site.

If such notifications are not made, the validity of the type approval certificate terminates.

**END OF CERTIFICATE**