Certificate No: **2607071922424610**
TL Project No: **26-1985**

TÜRK LOYDU

TYPE APPROVAL CERTIFICATE

This is to certify that the

Expansion Joint with Loose Flanges

Manufacturer : **RATTAY DK APS**

Address : **Energivej 20. 6700 Esbjerg, Denmark**

Product Type : **BR-3P-150-1-UN-1.4541/1.4878, SFL-1P-150-10-UN-1.4571, BRL-3P-150-1-UN-1.4878, BR-3P-150-6-UN-1.4878/1.4541**

Reference Rule : **TL Rules, Part E, Chapter 103 - Metallic Materials, Special Materials for Naval Ships, 01.01.2022**

TL Rules, Part E, Chapter 107 - Naval Ship Technology, Ship Operation Installations and Auxiliary System, 01.01.2022

TL Rules, Part A, Chapter 2, Material, 01.07.2024

TL Rules, Part B, Chapter 4 - Machinery, 01.01.2026

Subject to the conditions referred to in the following pages, this certificate is valid until **30.10.2029**
Surveyor: **Uğur MALKOÇ**

Issued at **İstanbul** on **07.07.2026**

This document is electronically signed and does not require a manual signature

Click here for the verification website

Emrah SÖĞÜTÇÜ
New Building Division Manager
TÜRK LOYDU

Expire Date of Previous Certificate: -
This certificate supersedes 2601081154463938 numbered certificate.

For Information Only

This certificate is subject to terms and conditions described below:
Any significant change in design or construction may render this Certificate invalid. Certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. This certificate is not valid for products without marking above mentioned. The manufacturer should notify TÜRK LOYDU of any modifications or changes to equipment in order to obtain valid certificate. This certificate shows that tested specimens as representative of the product complies of the TÜRK LOYDU rules, and relevant international instruments that apply to it.

Product	**: Expansion Joint with Loose Flanges**
Approval No / Date	**: PEA-EPAS/019004/24-0751/VA dated 24.06.2024** **PAE-EPAS/023288/25-4492/VA dated 11.12.2025** **PEA-EPAS/025133/26-1985/FP dated 18.06.2026**
Class Indication	**: Class III**
Nominal Diameter	**: DN 150**
Burst Pressure	**: 2.5 bar**
Minimum Design Cycle	**: 1000000**
Design Temperature	**: Please See Approval Conditions**
Performed Tests	**: - Quality Management System Audit** **- Visual Inspection** **- Controls According to Approved Drawings** **- Pressure Test** **- Burst Tests**
Test Place	**: Rattay DK ApS. - Energivej 20, 6700 Esbjerg, Denmark**
Last Inspection Date	**: 22.06.2026**
Application/Limitation	**: 1. The usage area of the relevant expansion joint are to be used in the pipe classes in accordance with TL Rules Part B, Chapter 4, Section 16, Table 16.1 and Table 16.5 and TL Rules Part E, Chapter 10, Section 8, Table 8.1 and Table 8.3.** **The use of flange types shall comply with TL Rules Part B, Chapter 4, Section 16, Table 16.17 and Table 16.18.** **2. Bellows generally have a wall thickness substantially less than the rest of the system with which they are used. Therefore, the bellows shall be manufactured from a material having the same or higher corrosion resistance than that used in the associated piping system.** **3. The expansion joints are to be installed in accordance with the manufacturer's instructions and TL Rules. Any pipe misalignment shall be avoided. Expansion joints shall not be used to compensate for design or fabrication deficiencies. They shall remain accessible for inspection and shall be protected against over-extension, over-compression and mechanical damage.** **4. Reduction factors for the maximum allowable working pressure and permissible movements due to temperature effects shall be applied in accordance with the manufacturer's instructions.** **5. The calculated maximum axial and lateral movements corresponding to the specified design fatigue life shall not be exceeded during service.** **6. Piping system drawings and supporting calculation notes shall be submitted for review whenever expansion bellows are installed on board TL-classed ships.** **7. The expansion joints are not intended for piping systems where excessive vibration levels are expected during normal service.** **8. The expansion joint is designed and calculated in accordance with EJMA 10. The applicable design conditions are:** **design pressure -0.3 / +0.5 bar, design temperature 0 / 580 °C, axial movement ±16 mm, lateral movement ±25 mm and angular rotation 0°**
Others	**: It is the manufacturer's responsibility to inform shipbuilders and/or their subcontractors of the proper methods for installation, operation and maintenance of the approved equipment, as well as the conditions and limitations associated with this approval.**

For Information Only

	Type of Product	Product Description	No of Node	Design Pressure	Test Pressure	Axial Expansion
1	BR-3P-150-1-UN-1.4541/1.4878	Expansion Joint with Loose Flanges (DN:150/L: 350 mm)	10	0.3 bar	0.45 bar	±15 mm
2	BR-3P-150-1-UN-1.4541/1.4878	Expansion Joint with Loose Flanges (DN:150/L: 350 mm)	10	0.5 bar	0.75 bar	±15 mm
3	SFL-1P-150-10-UN-1.4571	Expansion Joint with Loose Flanges (DN:150/L: 281 mm)	10	0.3 bar	0.45 bar	±3 mm
4	BRL-3P-150-1-UN-1.4878	Expansion Joint with Loose Flanges (DN:150/L: 350 mm)	10	0.5 bar	0.75 bar	±15 mm
5	BR-3P-150-6-UN-1.4878/1.4541	Expansion Joint with Loose Flanges (DN:150/L: 430 mm)	7 + 7	0.3 bar	0.5 bar	±16 mm (Latteral Expansion ±25mm)

Approval Conditions **: Material 1.4878 has been used as specified below.**
- The maximum design temperature for material 1.4578 is 580°C.
- The maximum design temperature for material 1.4541 is 550°C.
The approval only covers the expansion joint. Bolts, nuts, washers, and gaskets are excluded from the scope of approval.

For Information Only