



NIPPON KAIJI KYOKAI

TYPE APPROVAL CERTIFICATE

Certificate No. TA21108M

This is to certify that the undernoted products have been approved in accordance with the requirements 12.3.4, Chapt.12, Part D of "Rules for the Survey and Construction of Steel Ships" and Chapt.2, Part 6 "Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use".

This certificate is issued to

Manufacturer :	AL MUFADDAL ENGINEERING & MARINE SERVICES CO. LLC
Product description :	FLEXIBEL - Metallic Expansion Joints for Exhaust gas system, Steam & Condensate, Compressed air, Fresh water & Sea water
Place of Manufacturer:	Al Jaddaf, AMG workshop:01, Dubai UNITED ARAB EMIRATES
Type designation :	RE, TIED UNIVERSAL, UNIVERSAL, AXIAL, ANGULAR, EXHAUST
Approval No. :	21FV101
Valid until :	21 March 2026

This certificate is subject to the conditions specified in the attached sheet.

Issued at Tokyo on 22 March 2021.

T. Shimada
General Manager
Machinery Department

• **Particulars and conditions:**

FLEXIBEL Metallic Expansion Joints for Exhaust gas system, steam & condensate, compressed air, fresh water & sea water

Model No.	Size Range	Temperature Range(°C)	Pressure Range(barg)	Intended Fluid
Reinforcement Bellows	DN 100 ~ DN 400	-55~550	0.2~20	Steam & Condensate
TIED UNIVERSAL	DN100 ~ DN 3000		0.2~0.4	Exhaust gas system, Compressed air, Fresh water & Sea water
UNIVERSAL				
AXIAL				
ANGULAR	DN 100 ~ DN 1200			
EXHAUST	DN 100 ~ DN 3000			

• **Documents:**

Details of materials and constructions are to be in accordance with the manufacturer's drawings approved as followings.

Drawings: REINFORCED EXPANSION BELLOWS (RE) TYPICAL DN100 – DN400
TIED UNIVERSAL EXPANSION BELLOWS (TI) TYPICAL DN100 – DN3000,
UNIVERSAL EXPANSION BELLOWS (UN) TYPICAL DN100 – DN3000,
AXIAL EXPANSION BELLOWS (AX) TYPICAL DN100 – DN3000,
ANGULAR EXPANSION BELLOWS (AX) TYPICAL DN100 – DN1200,
EXHAUST EXPANSION BELLOWS (EX) TYPICAL DN100 – DN3000,
approved on dd March 2021

Test Report: EV-CRY-196006 dated 29/12/2019, AMG-HPT-008, AMG-HPT-009,
AMG-HPT-011, AMG-HPT-012, AMG-HPT-013, AMG-HPT-2019-057, AMG-HPT-
2019-058, AMG-HPT-2019-065, AMG-AJLT-2019-040, AMG-AJLT-2019-041

• **Type approval tests carried out:**

Reinforcement Bellows: Cyclic Thermal test, Cycle Fatigue Test, Pressure test performed at -165°C, Pressure test, Burst test

The others: Pressure test, Burst test and Leak test

- **Production tests:**

The joints used for piping belonging to Group I & II defined by the requirements 12.1.3, Chapter 12, Part D of the Society's Rules are to be subjected to hydraulic test in the presence of the Society's surveyor in accordance with the requirements 12.6.1, Chapter 12, Part D of the Society's Rules.

- **Notice:**

Any significant changes in design or construction of the above items may render this certificate invalid.

- The End -