



Marine &amp; Offshore

Certificate number: 39485/B1 BV

File number: ACM 188/2534/01

Product code: 21011

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*

**Al Mufaddal Engineering & Marine Services Co. LLC**  
DUBAI - UNITED ARAB EMIRATES

*for the type of product*

### METALLIC EXPANSION JOINTS / BELLOWS

FLEXIBEL - Metallic Expansion Joints for Exhaust gas system, steam & condensate, compressed air, fresh water & sea water - Types RE, UN, AN, AX, EX, TI

#### Requirements:

- BUREAU VERITAS Rules for the Classification of Steel Ships

*This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 18 Sep 2025**

**For Bureau Veritas Marine & Offshore,**

At BV DUBAI, on 07 Oct 2020,

Ashok Singh

*Ashok Kumar Singh*



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

The electronic version is available at: <http://www.veristarnb.com/veristarnb/jsp/viewPublicPdfTypepec.jsp?id=od0jpi0jp>

BV Mod. Ad.E 530 June 2017

This certificate consists of 3 page(s)

## **THE SCHEDULE OF APPROVAL**

### **1. PRODUCT DESCRIPTION**

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

#### 1.1 Technical data

Model	RE	UN	AN	AX	EX	TI
Type	Reinforced bellows	Universal bellows	Angular bellows	Axial bellows	Exhaust bellows	Tied expansion bellows
Nominal Size (mm)	DN 100 to 400	DN 100 to 3200	DN 100 to 1200	DN 100 to 3000	DN 100 to 3000	DN 100 to 3000
Design Pressure (bar)	2 to 20	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4
Maximum Design Temperature (°C)	-55 / 550	-55 / 550	-55 / 550	-55 / 550	-55 / 550	-55 / 550

- Design pressure, number of convolutions, movement, thickness and depth of convolution to be according to calculation performed by the manufacturer depending on the service conditions of expansion joints.

- Axial, lateral and/or angular movements as per drawings

#### 1.2 Material specification

Part	Material
Bellows	AISI 304/304L/321/316/316 L/347/S31803(2205)
Welded Flange	ANSI B16.5 Forged steel ASTM A-105 A36 / UNS S31803(2205) / SA 516 Grade 70 / S275JR

*When other choices of materials are used per manufacturer's instructions, the BV agreement is to be obtained.*

### **2. DOCUMENTS AND DRAWINGS**

- Drawing N° AMG/2014/360 Rev. 0 dated 30/11/2014
- Drawing N° AMG/2014/364 Rev. 0 dated 30/11/2014
- Drawing N° AMG/2014/361 Rev. 0 dated 30/11/2014
- Drawing N° AMG/2014/362 Rev. 0 dated 30/11/2014
- Drawing N° AMG/2014/359 Rev. 0 dated 30/11/2014
- Drawing N° AMG/2014/363 Rev. 0 dated 30/11/2014
- Drawing N° AMG/2019/1197-03 Rev. 0 dated 16/10/2019
- Calculation Sheets according to EJMA Code 9th Edition
- Installation Instructions Manual N° IIFMEJ/2020 Rev. 01

*No departure from the above documents shall be made without the prior consent of the Society. The manufacturer must inform the Society of any modification or changes to these documents and drawings.*

### **3. TEST REPORTS**

Type Tests carried out in presence of a BV Surveyor: Pressure test at twice the design pressure & burst test at 4 times the design pressure performed on representative bellows of sizes DN 200, DN 1500 & DN 3000:

- Test report dated 27/09/2014

Type Tests carried out in presence of a BV Surveyor: cycle fatigue test, pressure test at twice the design pressure & burst test at 5 times the design pressure performed on representative bellows of sizes DN 100 & DN 400:

- Test report dated 17/09/2014

### **4. APPLICATION / LIMITATION**

- 4.1 - The expansion joints may be used for exhaust gas system, steam & condensate, compressed air, fresh water & sea water.
- 4.2 - The use of stainless steel is to be restricted as per the requirements of BUREAU VERITAS Rules.
- 4.3 - Reduction factors are to be taken in consideration for maximum working pressure and tolerable movement caused by temperature influence according to manufacturer's instructions.
- 4.4 - The expansion joints are to be installed according to manufacturer's instructions and BUREAU VERITAS Rules.

4.5 - The expansion joints must only be fitted in areas where they are always accessible.

## **5. PRODUCTION SURVEY REQUIREMENTS**

5.1 - The products are to be supplied by **Al Mufaddal Engineering & Marine Services Co. LLC** in compliance with the type and the requirements described in this certificate.

5.2 - This type of product is within the category IBV of BUREAU VERITAS Rule Note NR320.

5.3 - BV product certificate is required.

5.4 - Each expansion joint is to be hydraulic pressure tested to 1.5 times the maximum working pressure under witnessing of a Society's Surveyor when required by the Rules.

5.5 - For information, **Al Mufaddal Engineering & Marine Services Co. LLC** has declared to Bureau Veritas the following production site:

**Al Mufaddal Engineering & Marine Services Co. LLC**  
**AMG Workshop Shed No :-01 ,**  
**Al Jaddaf ,**  
**PO Box 181440**  
**DUBAI**  
**UNITED ARAB EMIRATES**

## **6. MARKING OF PRODUCT**

Each expansion joint shall be clearly marked with at least:

- Manufacturer name or logo
- Type designation
- Maximum working pressure
- Society's brand as relevant

## **7. OTHERS**

It is **Al Mufaddal Engineering & Marine Services Co. LLC**'s responsibility to inform shipbuilders or their sub-contractors of the proper methods of fitting, use and general maintenance of the approved equipment and the conditions of this approval.

*This certificate supersedes the Type Approval Certificate N° 39485/B0 BV issued by the Society.*

\*\*\* END OF CERTIFICATE \*\*\*