Istanbul, 15.10.2015

Our Ref: NC/L/ 1530 /GY/15

HACI AYVAZ END.
MAMUL. SAN. VE TİC. A.Ş.
Attn. Mr. M. Erkan ALTUĞ

Subject:	**HACI AYVAZ END.** **TYPE APPROVAL CERTIFICATE** **METALLIC EXPANSION JOINTS / BELLOWS** **Adding of DN300 size and Renewal** **Certificate Number: 15889/B0 BV**

Dear Sirs,

We are sending you the certificate listed below which has been approved by us and which is intended for your use.

Best regards,

GÜRCAN YILMAZ

Encls: (1 Copy)

- Bureau Veritas Marine Division Type Approval Certificate (3 pages)

BUREAU VERITAS DENİZ ve GEMİ SINIFLANDIRMA HİZMETLERİ LTD. ŞTİ.
Ticaret Sicil No: 802375 - www.bureauveritas.com
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Marine & Offshore Division

Certificate number: 15889/B0 BV
File number: ACM 188/2512/03
Product code: 2101I

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

www.veristar.com

TYPE APPROVAL CERTIFICATE

This certificate is issued to

HACI AYVAZ END. MAMULLER SAN. VE TIC. A.S.

ISTANBUL - TURKEY

for the type of product

METALLIC EXPANSION JOINTS / BELLOWS

AYVAZ Axial/lateral Expansion Joints with fixed flanges PN 16 - DN 200 to DN 400

Requirements:
- BUREAU VERITAS Rules for the Classification of Steel Ships

This certificate is issued to attest that BUREAU VERITAS 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: 15 Oct 2020

For BUREAU VERITAS,
At BV ISTANBUL, on 15 Oct 2015,
Gurcan Yilmaz

BUREAU VERITAS SURVEYORS AT PARIS 1828 ISTANBUL INTERNATIONAL REGISTER

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. 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 Division available on the internet site 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 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 SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

AYVAZ Axial/lateral Expansion Joints with fixed flanges PN 16 - DN 200 to DN 400

1.1 Design Specifications

Nominal size/PN	DN 200/PN 16	DN 250/PN 16	DN 300/ PN16	DN 350/PN 10	DN 400/PN 10
Length (mm)	300	300	375	400	400
Max. working pressure (MPa)	0.1	0.1	0.1	0.1	0.1
Max. working temperature (°C)	+ 250	+ 250	+ 250	+ 250	+ 250
Tie rods	No	No	No	No	No
Movements (mm)	Axial +10/-50 Lateral + 50	Axial +10/-50 Lateral + 50	Axial +15/-45 Lateral + 50	Axial +15/-45 Lateral + 50	Axial +15/-45 Lateral + 50
Flanged type	Fixed	Fixed	Fixed	Fixed	Fixed
Number of plies	3	3	4	3	3
Number of convolutions	16	14	13	13	13

1.2 Materials

Part Name	Material
Bellow	AISI 316L
Band	AISI 316L
Flange	St 37,2

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

2. DOCUMENTS AND DRAWINGS

- Manufacturer's catalogue 1999 March Edition
- Drawings Expansion Joint with fixed flanges series
> N° 702.046.100.200 PN 16/DN 200 dated 30/09/2005
> N° 702.046.100.250 PN 16/DN 250 dated 30/09/2005
> N° 702.046.100.300 PN 16/DN 300 dated 30/07/2015
> N° 702.046.100.350 PN 10/DN 350 dated 30/09/2005
> N° 702.046.100.400 PN 10/DN 400 dated 30/09/2005
- Bellows design calculation-EJMA for DN 300 document N° AYVAZ/2015/292 Rev.0 dated 17/09/2015

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

3.1 Type tests according to Testing Programme performed in-house under supervision by a BV Surveyor:
- Pressure impulse test report N° TTAL.4.005 Rev.0 dated 25/10/2003 and test report N° 20151003 Rev.0 dated 02/10/2015
- Hydraulic pressure test at twice the max working pressure dated 2003 and test report for DN 300 N° 20151001 Rev.0 dated 02/10/2015
- Burst pressure test at 4 times the max working pressure report N° TTAL.4.007 Rev.0 dated 25/10/2003 and test report for DN 300 N° 20151002 Rev.0 dated 29/09/2015
- Cyclic expansion test report N° TTAL.4.006 Rev.0 dated 25/10/2003 and test report for DN 300 N° 20151003 Rev.0 dated 02/10/2015
- Dimension test report for DN 300 N° 20151010 dated 29/09/2015

3.2 Cyclic expansion tests (1000 cycles) are based on the tests valid for the products under the certificate 13480/C0 BV.

4. APPLICATION / LIMITATION

4.1 The expansion joints may be used for exhaust gas lines.
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 recommendations.
4.4 The calculated maximum values of axial and/or lateral movements at 1000 full cycles are not to be exceeded.
4.5 The expansion joints are to be installed according to manufacturer's instructions and BUREAU VERITAS Rules.

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4.6 In case of high level of vibrations in the piping systems where fitted to engines, pumps, compressors and other sources of high vibrations, care shall be taken in order to avoid that the natural frequency of compensator doesn't coincide with the system frequency.
4.7 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 **HACI AYVAZ END. MAMULLER SAN. VE TIC. A.S.** 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 Each expansion joint is to be hydraulic pressure tested to twice the maximum working pressure under witnessing of a Society's Surveyor when required by the Rules.
5.4 BV product certificate is required.

Place of production
HACI AYVAZ END. MAMULLER SAN. VE TIC. A.S.
ATATURK SAN. BOLGESI
MUSTAFA INAN CAD. NO:44
HADIMKOY
34860 ISTANBUL
TURKEY

6. MARKING OF PRODUCT

The product shall be marked with at least:
- Manufacturer's name or logo
- Type designation
- Date of manufacture
- Society's brand as relevant

7. OTHERS

This approval is given on the understanding that the manufacturer will accept full responsibility for informing shipbuilders or their sub-contractors of the proper methods of fitting and general maintenance of the products and of the conditions of this approval.
This certificate supersedes the Type Approval Certificate No. 15889/A0 BV issued on 10/11/2005 by the Society.

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

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