Istanbul, 08.04.2014

Our Ref: NC/L/0587/GY/14

HACI AYVAZ END. MAMUL. SAN. VE TİC. A.Ş.
Attn. Mr. Barış EYÜBOĞLU

Subject: **HACI AYVAZ END.**
RENEWAL OF TYPE APPROVAL CERTIFICATE
METALLIC EXPANSION JOINT / BELLOWS
Certificate Number: 13480/C0 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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Centrum İş Mrkz. Aydınevler
Sanayi Caddesi No:3 34854
Küçükyalı - Maltepe / İstanbul
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MARINE DIVISION

Certificate number: 13480/C0 BV
File number: ACM 188/2512/001
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 Expansion Joints PN 2,5 to PN 16 DN 25 to DN 1200

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

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 is a renewal of certificate N° 13480/B0 BV, which expires on 09/04/2014

This certificate will expire on: 09 Apr 2019

For BUREAU VERITAS,

At BV ISTANBUL, on 08 Apr 2014,

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 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 Expansion Joints

1.1 Design

Size	DN 25 to DN 1200	DN 40 to DN 350	DN 50 to DN 800
Working Pressure	PN 2,5	PN 16	PN 2,5
Max. Working Temperature	600 °C	550 °C	550 °C
Axial movements	-20 / +10 mm	-40 / +20 mm	-40 / +20 mm
Ends	Floating flange	Floating flange Welding end	Floating flange (PN 2,5 - PN 6) Flange (PN 10 - PN 16) / Welding end

1.2 Material specification

Bellow	1.4401 / 1.4404 / 1.4541
Band	1.0038 / 1.4401 / 1.4404 / 1.4541
Flange	1.0038
Welding end	1.0038

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 N° 702.056.240.040 to 702.056.240.350 Expansion Joint PN 16 DN 40-350
- Drawings N° 702.056.210.050 to 702.056.210.800 Expansion Joint PN 2,5 DN 50-800
- Drawings N° 702.036.213.050 to 702.056.213.800 Expansion Joint PN 2,5 DN 50-800
- Drawings N° 702.036.110.025 to 702.036.110.900, N° 702.036.110.010 and 702.036.110.012 Expansion Joint PN 2,5 DN 25-1200

3. TEST REPORTS

Type tests according to Testing Programme performed in-house under supervision of a Society's Surveyor:

- Pressure Impulse test, hydraulic pressure test, burst pressure test and cyclic expansion test

4. APPLICATION / LIMITATION

4.1 The expansion joints may be used for the following service on board:

- Exhaust gas lines, steam pressure lines
- Other marine class II and III piping systems according to the relevant requirements stated in Part C, Chapter 1, Sec 10 of BUREAU VERITAS Rules

4.2 The use of floating flanges is only permitted for Class III water pipes and open-ended lines.

4.3 The use of stainless steel is to be restricted as per the requirements of BUREAU VERITAS Rules.

4.4 Reduction factors are to be taken in consideration for maximum working pressure and tolerable movement caused by temperature influence according to manufacturer's recommendations.

4.5 The calculated maximum values of axial and/or lateral movements at 1000 full cycles are not to be exceeded.

4.6 The expansion joints are to be installed according to manufacturer's instructions and BUREAU VERITAS Rules.

4.7 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.

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

09.04.2019

BUREAU VERITAS SURVEYOR'S STAMP

08.04.2014

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 BV product certificate is required.

5.4 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

Place of production:
HACI AYVAZ END. MAMULLER SAN. VE TIC. A.S.
ATATURK SAN. BOLGESI
MUSTAFA INAN CAD. NO:36
HADIMKOY
34860 ISTANBUL
TURKEY

6. MARKING OF PRODUCT

Each expansion joint shall be marked clearly to avoid any wrong utilization with:

- Manufacturer's name or logo
- Type designation
- Date of manufacture
- Society's brand as relevant

7. OTHERS

This approval is given with 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 Certificates N° 13480/B0 BV & 21944/A0 BV issued respectively on 09/04/2009 & 01/10/2009 by the Society.

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

09.04.2019

08.04.2014