Marine & Offshore

Certificate number: SMS.W.II./132615/B.1

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RECOGNITION FOR

BV MODE II SCHEME

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.

ISTANBUL - Türkiye

Summary of the range of the recognition which is detailed in the subsequent page(s):

DESIGN AND PRODUCTION OF METALLIC EXPANSION JOINTS/BELLOWS

This certificate is issued to attest that Bureau Veritas Marine & Offshore has performed, at the above company's request and in compliance with the requirements of NR320, a satisfactory assessment of the manufacturing facilities and associated quality procedures related to the range of the recognition.

This certificate will expire on: 18 Apr 2026

For BUREAU VERITAS,

At BV ISTANBUL, on 02 Feb 2024,

Gurcan Yilmaz

This certificate was created electronically and is valid without signature

Certificate number: SMS.W.II./132615/B.1

THE SCHEDULE OF RECOGNITION

1. RANGE OF THE RECOGNITION

The products listed in the table below are to be certified individually or per batch by Bureau Veritas Marine & Offshore in compliance with the applicable requirements (IBV products as defined in NR320).

App. number	Validity date	Item designation	Trade name
11854/E0 BV	30 Jan 2029	METALLIC EXPANSION JOINTS / BELLOWS - 2101I	Type Balance I, Balance II, Balance III, Balance IV, Balance V, Balance VI - Type Balance I-F, Balance II-F, Balance III-F, Balance IV-F - Type RF-30-Axial, RF-60-Axial, FF-30-Axial, FF-60-Axial
16408/D1 BV	10 Nov 2027	METALLIC EXPANSION JOINTS / BELLOWS - 2101I	Type Balance VIII and Balance IX
67112/A1 BV	02 Feb 2027	METALLIC EXPANSION JOINTS / BELLOWS - 2101I	MARI Type 1, MARI Type 1F, MARI Type 2 and MARI Type 2F

2. LIMITATIONS

The certificates listed in the range of recognition are to be valid, as applicable.

Bureau Veritas Marine & Offshore is to be informed immediately of any modification to manufacturing facilities and associated quality procedures in order to agree on appropriate actions.

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S. has to apply for the periodical audits as agreed with Bureau Veritas Marine & Offshore.

3. PERIMETER OF CERTIFICATION

Quality system of following site(s) has been assessed:

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S. - ISTANBUL - Türkiye

4. REMARKS

1-The products are to be manufactured, examined and tested by the manufacturer in accordance with the Bureau Veritas Rules.
2-Arrangements shall be made for a Society's Surveyor to attend the tests and examinations at manufacturer's works in order to issue the Bureau Veritas certificate for the approved type to be fitted on board ships classed with Bureau Veritas.

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

Marine & Offshore

Certificate number: 11854/E0 BV
File number: ACM 188/2506/001
Product code: 2101I

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

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.

ISTANBUL - Türkiye

for the type of product

METALLIC EXPANSION JOINTS / BELLOWS

Type Balance I, Balance II, Balance III, Balance IV, Balance V, Balance VI - Type Balance I-F, Balance II-F, Balance III-F, Balance IV-F - Type RF-30-Axial, RF-60-Axial, FF-30-Axial, FF-60-Axial

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

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: 30 Jan 2029

For Bureau Veritas Marine & Offshore,
At BV ISTANBUL, on 30 Jan 2024,
Gurcan Yilmaz

This certificate was created electronically and is valid without signature

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

1.1 Expansion Joints - Type Balance I, Balance II, Balance III, Balance IV, Balance V, Balance VI

Type	Size	M.A.W.P (bar)	Movement
Balance I	DN 32 to DN 1000	2.5	Axial-Lateral
Balance II	DN 40 to DN 500	2.5	Axial-Lateral
Balance III	DN 100 to DN 350	2.5	Axial-Lateral
Balance IV	DN 40 to DN 300	2.5	Axial-Lateral
Balance V	DN 40 to DN 400	2.5	Axial-Lateral
Balance VI	DN 40 to DN 300	16	Axial

- Design: Metallic bellows
- Max. Working Temperature: 550 °C
- Ends: Weld-End, flanged end and lap joint flange
- Axial and/or lateral movement as per drawings
- The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.2 Expansion Joints - Type Balance I-F, Balance II-F, Balance III-F, Balance IV-F

Type	Size	M.A.W.P (bar)	Movement
Balance I-F	DN 32 to DN 1000	2.5	Axial-Lateral
Balance II-F	DN 40 to DN 500	2.5	Axial-Lateral
Balance III-F	DN 100 to DN 350	2.5	Axial-Lateral
Balance IV-F	DN 40 to DN 300	2.5	Axial-Lateral

- Design: Metallic bellows
- Max. Working Temperature: 550 °C
- Ends: Weld-End and flanged end
- Axial and/or lateral movement as per drawings
- The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.3 Expansion Joints - Type RF-30-Axial, RF-60-Axial, FF-30-Axial, FF-60-Axial

Type	Size	M.A.W.P (bar)	Movement
RF-30-Axial	DN 40 to DN 300	16	Axial
RF-60-Axial	DN 65 to DN 300	16	Axial
FF-30-Axial	DN 40 to DN 300	16	Axial
FF-60-Axial	DN 65 to DN 300	16	Axial

- Design: Metallic bellows
- Max. Working Temperature: 550 °C
- Ends: Flanged end and lap joint flange
- Axial and/or lateral movement as per drawings
- The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.4 Material specification

Bellows	AISI 321, AISI 316, AISI 316L, AISI 304, AISI 304L,
Welding ends and Flanges	S235,S275, S355, P235, P265, P355, 16Mo3, AISI 321, AISI 316, AISI 316L, AISI 304, AISI 304L

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

2. DOCUMENTS AND DRAWINGS

- Drawings, and specifications sheets dated 03/10/2023:

PT-001-BAL.0 Rev. 1	PT-002-BAL2.0 Rev. 1	PT-003-BAL3.0 Rev. 1	PT-004-BAL4.0 Rev. 1	PT-005-BAL5.0 Rev. 1
PT-006-BAL6.0 Rev. 1	PT-007-BALF.0 Rev. 1	PT-008-BAL2F.0 Rev. 1	PT-009-BAL3F.0 Rev. 1	PT-010-BAL4F.0 Rev. 1
PT-011-RF30.0 Rev. 1	PT-012-RF60.0 Rev. 1	PT-013-FF30.0 Rev. 1	PT-014-FF60.0 Rev. 1	

- Documents of Type Approval Test: RP 20.08.03-01
- Material inspection certificate N°F0 2016 38525 200011 dated September 2016

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 under supervision of a Society's Surveyor: Hydraulic pressure test, burst pressure test, cyclic expansion test.
- Test report N° RP.20.08.03-01 dated 08/2003
- Evaluation of material tensile strength at 550 °C report N°R171437 dated 29/09/2017
- Test report Acc. to BV NR216, Ch.2, Sec.1 Table 34 as AISI 321 grade report N°R171436 dated 29/09/2017

4. APPLICATION / LIMITATION

4.1 The expansion joints may be used for the following services on board depending on type:

- Fresh water, steam and condensate, compressed air, fuel oil and lubricating oil, hydraulic oil, cargo on board oil tanker and chemical tankers, thermal oil, exhaust gases (engine, turbine, boiler, heat generator)

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

4.3 The use of stainless steel is to be restricted as per the requirements of the Society's Rules.

4.4 The use of lap joint flanges is only permitted for Class III water pipes and open-ended lines.

4.5 The metallic flexible pipes are not to be fitted on diesel engines or in steering gear room.

4.6 Materials are to be compatible with the cargoes intended to be carried.

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

4.8 The expansion joints are to be installed according to manufacturer's instructions and Bureau Veritas Rules and Regulations stated on the front page of this certificate.

4.9 The expansion joints are to be fitted in areas where they are always accessible.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 The products are to be supplied by **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. 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 certificte is required.

5.4 Each expansion joint with end connections is to be hydraulically pressure tested to 1.5 the maximum working pressure and provided with the manufacturer's pressure test report and conformity of production.

5.5 For information, **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.** has declared to Bureau Veritas the following production site:

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.

Istanbul Endustri ve Ticaret Serbest Bolgesi
Orhanli Mevkii 6. Sok. No:111/6 Parsel
Tuzla
34957 ISTANBUL
TURKEY

6. MARKING OF PRODUCT

Each expansion joint is to be marked clearly to avoid any wrong utilization with at least:

- Manufacturer name or logo
- Type designation
- Date of manufacture
- Nominal Diameter
- Design pressure
- Design temperature
- Society's brand as relevant

7. OTHERS

It is **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.'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° 11854/D1 BV issued by the Society.

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

Marine & Offshore

Certificate number: 16408/D1 BV
File number: ACM 188/2506/02
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

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.

ISTANBUL - Türkiye

for the type of product

METALLIC EXPANSION JOINTS / BELLOWS

Type Balance VIII and Balance IX

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: 10 Nov 2027

For Bureau Veritas Marine & Offshore,
At BV ISTANBUL, on 30 Jan 2024,
Gurcan Yilmaz

This certificate was created electronically and is valid without signature

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Metallic Bellows Expansion Joints - Type Balance VIII and Balance IX

1.1 Design Specifications

Type	Size	Maxi. Working Pressure (MPa)	Maximum Working Temperature (°C)	Movement *	End connections
Balance VIII	DN 80 to 1200	0.25	550	Axial-Lateral	Flanged
Balance IX	DN 80 to 1200	0.25	550	Axial-Lateral	Flanged

* Axial and lateral movement as per manufacturer's drawings

The maximum working pressure is not to exceed one quarter of the burst pressure at the service temperature.

1.2 Material specification

Part	Material
Bellows	AISI 321, AISI 316, AISI 316L, AISI 304, AISI 304L
Flanges	S235, S275, S355, P235, P265, P355, 16Mo3, AISI 321, AISI 316, AISI 316L, AISI 304, AISI 304L

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

2. DOCUMENTS AND DRAWINGS

- Drawings N° US1BU-03 rev. 4 dated 31/10/2023 : Balance VIII
- Drawings N° US3BU-03 rev. 4 dated 03/11/2022 : Balance IX
- EJMA 10th Edition 2010 calculation sheets dated 18/05/2017.

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

- Test report N° PR-82-04 dated 03/07/2017 witnessed by a BV Surveyor
- Dimension check report N° RP-82-05 Rev. 1 dated 22/12/2016 witnessed by a BV Surveyor.
- Fatigue test reports N° 2017/F1 dated 18/07/2017& N° 2017/F2 dated 19/07/2017.
- Hydrostatic and Burst test report N° 2017/B1 dated 28/07/2017, N° 2017/B2 dated 28/07/2017, N° 2017/B3 dated 03/07/2017, N° 2017/B4 dated 03/07/2017 & N° 2017/B5 dated 01/08/2017 witnessed by a BV Surveyor.
- Vibration test report N° 2017/V1 dated 03/07/2017, N° 2017/V2 dated 03/07/2017, N° 2017/V3 dated 24/07/2017, N° 2017/V3 dated 24/07/2017, N° 2017/V5 dated 28/07/2017 witnessed by a BV Surveyor.
- Tensile test reports N° R171436 & R171437 dated 29/09/2017 witnessed by a BV Surveyor.
- Hydrostatic test report for modification of Balance VIII : Test report N° RP.8.5.1-09/1 to 6 dated 18/12/2023

4. APPLICATION / LIMITATION

4.1 - The expansion joints may be used for the following general use and exhaust gas lines:

- Fresh water, steam and condensate, compressed air, fuel oil and lubricating oil, cargo on board oil tanker, thermal oil, exhaust gases (engine, turbine, boiler, heat generator).

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

4.3 - The use of stainless steel is to be restricted as per the requirements of the Bureau Veritas Rules.

4.4 - The use of lap joint flanges is only permitted for Class III water pipes and open-ended lines.

4.5 - Materials are to be compatible with the cargoes intended to be carried.

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

4.7 - The expansion joints are to be installed according to manufacturer's instructions and Bureau Veritas Rules.

4.8 - 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 **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. 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 with end fittings is to be hydraulically pressure tested to 1.5 the maximum working pressure under witnessing of a Society's Surveyor when required by the Rules.

5.5 - For information, **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.** has declared to Bureau Veritas the following production site:

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.
Istanbul Endustri ve Ticaret Serbest Bolgesi
Orhanli Mevkii 6. Sok. No:111/6 Parsel
Tuzla
34957 ISTANBUL
TURKEY

6. MARKING OF PRODUCT

Each product shall be marked with at least:

- Manufacturer name or logo
- Type designation
- Date of manufacture
- Nominal Diameter
- Design pressure
- Design temperature
- Society's brand as relevant

7. OTHERS

It is **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.**'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° 16408/D0 BV issued by the Society.

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

Marine & Offshore

Certificate number: 67112/A1 BV
File number: .
Product code: 2101I

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

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.

ISTANBUL - TURKEY

for the type of product

METALLIC EXPANSION JOINTS / BELLOWS

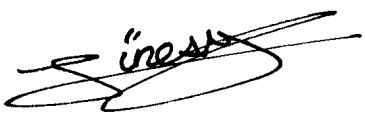
MARI Type 1, MARI Type 1F, MARI Type 2 and MARI Type 2F

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: 02 Feb 2027

For Bureau Veritas Marine & Offshore,
At BV ISTANBUL, on 24 Feb 2022,
Gurcan Yilmaz



THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION

Metallic expansion joints MARI Type 1, MARI Type 1F, MARI Type 2 and MARI Type 2F

1.1. Ratings

Model	MARI Type 1, MARI Type 1F	MARI Type 2, MARI Type 2F
Size range	32~1000	40~500
Design Standard	EJMA 10th Edition	EJMA 10th Edition
Design Pressure (bar)	2,5	2,5
Design Temperature (°C)	0/+550	0/+550
End connections	Weld end/ Flanged	Weld end/ Flanged
Allowable displacement	As per bellows design calculation sheets	As per bellows design calculation sheets
Number of plie		
Number of cycles		

1.2: Materials

Part	Material
Bellow	AISI 321
End pipe	Carbon steel, AISI 304, AISI 316, AISI 321
Flanges	Carbon steel, AISI 304, AISI 316, AISI 321

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

2. DOCUMENTS AND DRAWINGS

- Drawing N°MARI Type 1F Rev. 01 dated 02/07/2020: MARI Type 1F
- Drawing N°MARI Type 1 Rev. 01 dated 02/07/2020: MARI Type 1
- Drawing N°MARI Type 2F Rev. 01 dated 02/07/2020: MARI Type 2F
- Drawing N°MARI Type 2 Rev. 01 dated 02/07/2020: MARI Type 2
- Manual of installation, use and maintenance N°TL.713-38 Rev.00 dated 16/08/2021
- Calculation Sheets dated 29/04/2020
- Calculation Sheets dated 30/04/2020
- Calculation Sheets dated 02/06/2020

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 witnessed by a BV Surveyor including burst test at 4 times the design pressure, vibration test, hydrostatic test and cycle test :

- Test report N° RP-21-TA-08 dated 13/10/2021

3.2 Fire resistance test not performed..

4. APPLICATION / LIMITATION

4.1 - May be used for exhaust gas piping systems.

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

4.3 - The calculated maximum values of axial and lateral movements at design full cycles are not to be exceeded.

4.4 - In all cases, the associated pipelines are to be suitably aligned, supported and anchored. The joints are to be at any time accessible, well visible and protected against over extension and compression and against mechanical damage.

4.5 - Piping system drawings and calculation notes are to be submitted for review whenever expansion bellows are fitted on board BV-classed ships.

4.6 - The joints are to be installed according to manufacturer's instructions and Bureau Veritas Rules requirements.

4.7 - The expansion joint are not to be used in piping systems where high levels of vibration are expected to occur in service.

5. PRODUCTION SURVEY REQUIREMENTS

5.1 - The products are to be supplied by **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. 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 BV Rule Note NR320.

5.3 - BV product certificate is required.

5.4 - Each metallic expansion joint with end fittings is to be hydraulically pressure tested to 1.5 times the maximum working pressure and provided with the manufacturer's pressure test report and conformity of production.

5.5 - For information, **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.** has declared to Bureau Veritas the following production site:

KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.
Istanbul Endustri ve Ticaret Serbest Bolgesi
Orhanli Mevkii 6. Sok. No:111/6 Parsel
Tuzla
34957 ISTANBUL
TURKEY

6. MARKING OF PRODUCT

Each expansion joint shall be permanently marked with at least:

- Manufacturer’s name or trademark
- Date of manufacture (month/year)
- Designation type reference
- Nominal diameter
- Pressure rating
- Temperature rating
- Society's brand as relevant

7. OTHERS

It is **KLINGER TURKEY ESNEK BAGLANTI ELEMANLARI TIC. VE SAN. A.S.**'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.

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