



TYPE APPROVAL CERTIFICATE
No. MAC010522XT

This is to certify that the product identified below satisfies the requirements of the standard quoted under "Reference standard"

<i>Description</i>	Metallic expansion joints
<i>Type</i>	AYVAZ Axial Expansion Joints PN2,5 to PN16 - DN25 to DN1200
<i>Applicant</i>	HACI AYVAZ ENDUSTRIYEL MAMULLER SAN. VE TIC. A.S.
<i>Manufacturer</i>	HACI AYVAZ ENDUSTRIYEL MAMULLER SAN. VE TIC. A.S.
<i>Place of manufacture</i>	ATATURK SANAYI BOLGESI , HADIMKOY MAHALLESİ MUSTAFA INAN CADDESİ, NO.44 ARNAVUTKOY -ISTANBUL 34555 Hadimkoy TURKEY
<i>Reference standards</i>	RINA Rules for the Type Approval of Flexible Hoses and Expansion Joints

Issued in **ISTANBUL** on **January 31, 2022.** *This Certificate is valid until* **January 30, 2027**

RINA Services S.p.A.
Volkan Celik



This certificate consists of this page and 1 enclosure



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1. TECHNICAL CHARACTERISTICS

AYVAZ Axial Expansion Joints

1.1 Design Specifications

Size	DN 25 to DN 1200	DN 40 to DN 350	DN 50 to DN 800
Working Pressure	PN2,5	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 Materials

Bellow	1.4401 / 1.4404 / 1.4541
Band	1.0038 / 14401 / 14404 / 1.4541
Flange	1.0038
Welding end	1.0038

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

2. 2. REFERENCE DOCUMENTS

- Manufacturer's catalogue 1999 March Edition
- Drawings Nr 702.056.240.040 to 702.056.240.350 Expansion Joint PN 16 DN40-350
- Drawings Nr 702.056.210.050 to 702.056.210.800 Expansion Joint PN 2.5 DN 50-800
- Drawings Nr 702.036.213.050 to 702.056.213.800 Expansion Joint PN 2.5 DN50-800
- Drawings Nr 702.036.110.025 to 702.036.110.900, Nr 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,
- Pressure Impulse test, hydraulic pressure test, burst pressure test and cyclic expansion test,

4. FIELDS OF APPLICATION

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 RINA 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 RINA 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 RINA 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

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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.

5. ACCEPTANCE CONDITIONS

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 RINA product certificate is required.

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

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

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.