



TYPE APPROVAL CERTIFICATE
No. MAC102820XT/001

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

<i>Description</i>	Metallic Expansion Joint
<i>Type</i>	BMK-E & BMK-E/Y
<i>Applicant</i>	HACI AYVAZ ENDUSTRIYEL MAMULLER SAN. VE TIC. A.S.
	ATATURK SANAYI BOLGESI, MUSTAFA INAN CAD., NO.44 ISTANBUL
	34555 Hadimkoy
	TURKEY
<i>Manufacturer</i>	HACI AYVAZ ENDUSTRIYEL MAMULLER SAN. VE TIC. A.S.
<i>Place of manufacture</i>	Ataturk Sanayi Bolgesi, Mustafa Inan Cad., No.44 Istanbul
	34555 Hadimkoy
	Turkey
<i>Reference standards</i>	RINA "Rules for the Type Approval of Flexible Hoses and Expansion Joints"
<i>Reference documents</i>	Rules for the type approval.

Issued in **RINA Turkey Marine** on **April 10, 2021.** *This Certificate is valid until* **December 2, 2025**

RINA Services S.p.A.
Volkan Celik

This certificate consists of this page and 1 enclosure



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BMK-E & BMK-E/Y

Reference documents:

Design Drawings reviewed under RINA dwg nos.: ISMC-5805 & ISMC-5806
Test Reports filed for our reference under "2020XT011028 endorsement".

Technical Characteristics & Fields of Application:

- Expansion bellows covered by this certificate are found to be in compliance with the given design standard and may be installed in exhaust gas systems and scrubber systems.
- No lateral and angular movements
- Approved life cycles: 1000 cycles
- Limitation on velocity: 7.32 m/s for all sizes without sleeve
- Max. working pressure: 16 Bar for E0803-03 ; 0,5 Bar for E0803-04
- Sizes: DN25 to DN350 for E0803-03 ; DN200 to DN 3000 for E0803-04
- The Minimum design temperature is 0°C and the maximum design temperature is limited for materials as per below table:

Standard	Designation	Maximum Design Temperature
EN10095	ALL	+400 °C
EN10028-2	ALL	+400 °C
EN10028-7	1.4301, 1.4306, 1.4307, 1.4311, 1.4315, 1.4401, 1.4404, 1.4406, 1.4420, 1.4429, 1.4432, 1.4434, 1.4435, 1.4436, 1.4438, 1.4439, 1.4529, 1.4541, 1.4550, 1.4563, 1.4571, 1.4580, 1.4910, 1.4941, 1.4948, 1.4950, 1.4951, 1.4958, 1.4959, 1.4961	+550°C
	1.4547 ^(*)	+500°C
	1.4335, 1.4539, 1.4537	+400°C
	1.4318, 1.4466	+350°C
	1.4410 ^(*)	+250°C
EN10025-2	1.0038	+50°C
ASME SA-240	304, 304H, 316, 316H, 317, 304L, 316L, 321, 321H, 347, 347H, 348, 348H, 309H, 310, 310H, S31254, S32750, S32760, 309S, 310S	+300°C
ASME SA-516	60, 70	+300°C

(*) Only these materials are allowed to be used in seawater lines of scrubber systems.
The installation shall be done according to type approval holder's procedures.

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- Approved movement: axial for BMK-E (RINA dwg no: ISMC-5805/Cad No: E0803-03) and axial / Lateral for BMK-E/Y (RINA dwg no: ISMC-5806/Cad No: E0803-04) to be as per below;

BMK-E (mm)	BMK-E/Y (mm)					
	Axial	Lateral	Axial	Lateral	Axial	Lateral
DN25 -14/+6	DN200 +50/-130	DN200 +/- 95	DN850 +100/-175	DN850 +/- 32	DN2000 +100/-175	DN2000 +/- 14
DN32 -14/+6	DN250 +50/-190	DN250 +/- 95	DN900 +100/-175	DN900 +/- 30	DN2100 +50/-175	DN2100 +/- 10
DN40 -17/+6	DN300 +100/-190	DN300 +/- 90	DN950 +100/-175	DN950 +/- 30	DN2200 +50/-175	DN2200 +/- 10
DN50 -21/+7	DN350 +100/-190	DN350 +/- 80	DN1000 +100/-175	DN1000 +/- 28	DN2300 +50/-175	DN2300 +/- 9
DN65 -21/+7	DN400 +100/-190	DN400 +/- 75	DN1100 +100/-175	DN1100 +/- 26	DN2400 +50/-175	DN2400 +/- 9
DN80 -26/+10	DN450 +100/-190	DN450 +/- 70	DN1200 +100/-175	DN1200 +/- 24	DN2500 +50/-175	DN2500 +/- 8
DN100 -28/+10	DN500 +100/-175	DN500 +/- 60	DN1300 +100/-175	DN1300 +/- 22	DN2600 +50/-175	DN2600 +/- 8
DN125 -28/+10	DN550 +100/-175	DN550 +/- 50	DN1400 +100/-175	DN1400 +/- 20	DN2700 +50/-175	DN2700 +/- 8
DN150 -38/+10	DN600 +100/-175	DN600 +/- 48	DN1500 +100/-175	DN1500 +/- 18	DN2800 +50/-175	DN2800 +/- 7
DN200 -40/+10	DN650 +100/-175	DN650 +/- 45	DN1600 +100/-175	DN1600 +/- 17	DN2900 +50/-175	DN2900 +/- 7
DN250 -50/+10	DN700 +100/-175	DN700 +/- 42	DN1700 +100/-175	DN1700 +/- 16	DN3000 +50/-175	DN3000 +/- 7
DN300 -50/+10	DN750 +100/-175	DN750 +/- 38	DN1800 +100/-175	DN1800 +/- 15		
DN350 -60/+15	DN800 +100/-175	DN800 +/- 35	DN1900 +100/-175	DN1900 +/- 14		

Acceptance conditions:

1. The acceptance of this product on board ships and other units classed by RINA is subject to the satisfactory outcome of testing as per the RINA Rules Part C, Chapter 1, Section 10, Article 21.2.1.
2. This product is not to be installed where it may be subjected to torsion deformation (twisting) under normal operating conditions.
3. The installation on board is to be made in accordance with the Manufacturer's instructions.

Marking:

This product is to be permanently marked by the Manufacturer with the following details:

- Manufacturer's name or trademark
- date of manufacture (month/year)
- designation type reference
- nominal diameter
- maximum design pressure
- maximum and minimum design temperatures.

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.

RINA Turkey Marine April 10, 2021