

EU RO Mutual Recognition Technical Requirements

VALVES – BOILER WATER SYSTEMS (CLASS III)	Version	0.1
	Adoption Date:	1 February 2023
	Application Date:	1 July 2023
	Tier	6
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1. PRODUCT DESCRIPTION	1
2. DESIGN EVALUATION.....	2
3. PRODUCTION REQUIREMENTS.....	5
4. MARKING REQUIREMENTS.....	6
5. TYPE APPROVAL CERTIFICATE CONTENT	6
6. APPROVAL DATE AND REVISION NUMBER.....	6
7. BACKGROUND INFORMATION / REFERENCES.....	6
8. MAINTENANCE & CLARIFICATION OF TECHNICAL REQUIREMENTS	7
9. LEGAL PROVISIONS / COPYRIGHT.....	7

1. PRODUCT DESCRIPTION

1.a General description of the product

Valves for boiler water systems of Class III piping as defined by IACS UR P2.2 Rev.4 intended to stop or modify water flow in boiler water systems.

1.b Application limitations†

- a) These Technical Requirements apply to valves dedicated to boiler water (feed water, condensate water, drain water) systems of Class III with design pressure up to 1.6 MPa and design temperature up to 200°C, and diameter up to 100 mm;
- b) These Technical Requirements are not applicable to:
 - valves intended to be fitted on the ship's side and valves intended to be fitted on the ship's collision bulkhead;
 - hydraulically, electrically or pneumatically controlled devices for valves;
 - plastic valves.

† The EU MR type approved product is generally not used as a stand-alone product, but integrated as component in a sub-system or system. When a product is presented with an EU RO MR Type Approval Certificate for given application, its acceptability with regards to conditions defined in 1b, 1c and 1d of this Technical Requirement will be evaluated by the EU RO in charge of classing the ship or being in charge of the unit/system certification.

1.c Intended use

Piping systems for boiler water (feed water, condensate water, drain water) with a design pressure up to 1.6 MPa and design temperature up to 200°C.

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1.d System context

As per item 1c.

2. DESIGN EVALUATION

2.a Engineering evaluation requirements

2.a i. Technical Requirements

Design:

- a) Valves in piping systems shall be compatible with the pipes to which they are attached, in respect of their strength, and shall be suitable for effective operation at the maximum working pressure and rated flow that they will experience in service;
- b) Valves shall be designed and manufactured in accordance with recognized standards such as ISO standards, API specifications, etc.;
- c) Valves and accessories shall be designed so as to prevent the loosening of covers and glands when they are in use. Accessories means devices with an operational function which have pressure bearing housings;
- d) Valves shall be so designed as to shut with a right-hand (clockwise) motion of the wheels;
- e) Valves shall be provided with local indicators showing whether they are open or shut unless this is readily apparent;
- f) When the valves are designed for one way flow, the direction of flow shall be clearly and legibly marked on the valve. The direction may be cast into the valve casing, such as for screw-down and other non-return valves;
- g) Valves shall be fitted with nameplates to indicate their purpose(s);
- h) Suitable positive means of securing the spindle shall be provided on valves where the spindle is turned between fully open and fully closed position. Manually operated butterfly valves, which are designed for throttling service, shall be equipped with a locking arrangement that holds the disc in any relevant position;
- i) Minimum design pressure 0.35 MPa.

Materials:

- j) Valves bodies for boiler water systems are to be made of forged or cast steel, bronze or stainless steel. Nodular cast iron of the ferritic type may be used,

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provided that the minimum elongation is not less than 12% on a gauge length of $5,65 \times S^{0,5}$, where S is the actual cross-sectional area of the test piece. Nodular cast iron of the ferritic type, with specified minimum elongation of 12%, may be used for minimum design temperature not less than 0°C. Nodular cast iron of the ferritic/pearlitic and pearlitic types shall not be used as the material of pressurized parts, unless maximum design temperature is less than 120°C. Grey cast iron may be used for casings of valves not intended to be installed on boilers, provided that the ultimate strength of the grey cast iron is not less than 200 MPa and the maximum design temperature is less than 120°C;

- k) The use of asbestos is prohibited;
- l) Aluminium and aluminium alloys are not permitted for use for casing of boiler water valves;
- m) Grey cast iron is not permitted for use in piping which is subject to pressure shock, vibrations, or excessive strain (e.g. blow-off piping etc.);
- n) The materials to be used for the other component parts of the valves (i.e. trim, stems, discs, disc faces, seats etc.) shall be corrosion resistant and suitable for the working medium and the intended service. Non-metallic material of gaskets or seals shall be approved in accordance with the recognized standards for the use with boiler water and for design temperatures not less than 200°C.

Type of connections:

- o) Butt welded, slip-on sleeve and socket welding joints shall be used in the connecting of valves;
- p) Threaded joints shall be permitted for an outside diameter not exceeding 60.3 mm;
- q) Weld neck (butt-welded) flanges are permitted; slip-on flanges (see below Figure 1) are permitted for design temperatures up to 150°C and if double-fillet welded or equivalent; socket-welded flanges (one fillet only) are permitted up to 80 mm DN; loose-flanged ends (unattached) are not permitted;

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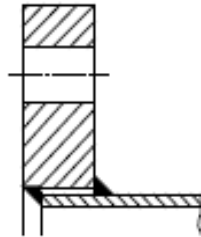


Fig. 1

- r) The dimensions of flanges and relative bolts shall be chosen in accordance with the relevant national standards. Flange attachments shall be in accordance with national or international standards that are relevant to the piping system and are to recognize the applicable boundary fluids, design pressure and temperature conditions, external or cyclic loading and location.

2.a.ii. Technical documents to be submitted

IMPORTANT: The English Language shall be used for all submitted documents.

- The standard used by the manufacturer shall be clearly identified in the documentation submitted;
- Assembly drawings showing dimensions, internal parts (valve body and coupling flange, valve disc and rod, valve seat), materials, internal seals/gaskets data sheet, type of connections shall be submitted for EU RO review;
- Design analysis shall be submitted. Design analysis may be based on design by rule (according to a recognized standard) or based on experimental method (such as burst test according to a recognized standard);
- Product descriptions including nominal diameter, intended services, installation locations, intended fluids, working medium, rated flow, design pressure, temperature range, maximum turning torque of spindle, certificates and reports of relevant tests previously carried out, instructions on operation, performance specification shall be submitted for EU RO review.

2.b Type testing requirements

- Type tests shall be carried out as per the referenced standard;
- The maximum turning torque of spindle shall be checked for remote control against the applicable design requirements;

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- c) Test specimens shall be selected from the production line or 'at random' from stock;†
- d) Where there are various sizes of the type of valve requiring approval, a minimum of three separate sizes representative of the range from each type of joints (minimum, middle and maximum nominal diameter) shall be subject to the hydrostatic test at the following value of pressure:
PH = 1,5P, but not less than 0,5 MPa
where PH = test pressure (MPa), P = design pressure (MPa)
or the pressure indicated by the reference standard for valves, whichever is the largest;
- e) Hydrostatic tests shall be carried out in both the closed and open position of the valve;
- f) Tightness testing (hydrostatic seat leakage test) shall be carried out at the test pressure of 1,1 times the design pressure.
- g) Burst test of the valve body according to a recognized standard is to be carried out on test specimens. Test pressure is to be 4 times the design pressure for cast steel and 5 times the design pressure for nodular cast iron and bronze.
- h) Type tests for type approval shall be carried out in the presence of a RO surveyor. In cases where the tests are conducted at Nationally Accredited Laboratories, the presence of the EU RO Surveyor may be omitted.†

† For further clarification of witnessing of tests and sampling the test specimen(s), refer to paragraphs 6, 7 and 8 of the EU RO "Design Evaluation Scheme" procedure (Appendix V of EU RO Framework Document for the Mutual Recognition of Type Approval found on [Technical Requirements \(euomr.org\)](http://www.euomr.org/technical-requirements)).

2.c Type testing requirements for certificate renewal

The manufacturer is to notify the RO of any modification or changes to the manufacturing specifications that may affect the MR TA to be renewed.

3. PRODUCTION REQUIREMENTS

- a) Refer to EU RO "Product Quality Assurance (PQA)" procedure (Appendix VI of EU RO Framework Document for the Mutual Recognition of Type Approval found on [Technical Requirements \(euomr.org\)](http://www.euomr.org/technical-requirements))

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- b) All valve bodies having a design pressure greater than 0.1 MPa shall be subject to a hydrostatic test at the following value of pressure:
PH = 1,5P, but not less than 0,5 MPa
where PH = test pressure (MPa), P = design pressure (MPa);
- c) After assembly, the valves shall be checked for leakage by a hydraulic pressure equal to 1.1 times the design pressure;
- d) Certificate of test is to be delivered.

4. MARKING REQUIREMENTS

Manufacturers of the approved equipment are, in principle, to mark the product before shipment for identification of approved equipment as per referenced standard. In addition, and as a minimum, the following items to be marked at the suitable place:

- a) Manufacturer's name or equivalent;
- b) Type No. or symbol;
- c) Serial No. and date of manufacture;
- d) Particulars or ratings.

5. TYPE APPROVAL CERTIFICATE CONTENT

The EU RO MR Type Approval Certificate shall contain the minimum information as defined in the EU RO Framework Document for the Mutual Recognition of Type Approval - see Appendix I of EU RO MR Type Approval Certificate Information.

6. APPROVAL DATE AND REVISION NUMBER

Date	Revision	Comment
2018-01-01	0.0	Approved by EU RO MR Steering Committee
2023-02-01	0.1	Added para. 2c Added para. 9 Copyright (ref. 21030_)

7. BACKGROUND INFORMATION / REFERENCES

- a) EU RO Framework Document for the Mutual Recognition of Type Approval;
- b) IACS UR P2 (Rev.2 Nov 2001) "Rules for piping design, construction and testing";

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- c) ISO 5208-2015 "Industrial Valves-Pressure testing";
- d) ISO 5209-1977 "General purpose industrial valves-marking".

8. MAINTENANCE & CLARIFICATION OF TECHNICAL REQUIREMENTS

Anyone wishing to propose changes to this document or request clarification of technical issues should contact the EU RO MR Group Secretariat in the first instance:
Secretariat@euromr.org.

Review and approval of change requests shall follow the EU RO MR Maintenance Process detailed in the EU RO Framework Document for the Mutual Recognition of Type Approval: [Technical Requirements \(euromr.org\)](http://www.euromr.org/technical-requirements)

9. LEGAL PROVISIONS / COPYRIGHT

- a) Underlying legal provisions in accordance with EU RO Framework Document for the Mutual Recognition of Type Approval;
- b) Copyright © 2022. All EU RO MR Group rights reserved. For a list of EU RO MR Group members please see [About EU RO MR](#).

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