

EU RO Mutual Recognition Technical Requirements

STRAINERS	Version	0.1
	Adoption Date:	1 January 2023
	Application Date:	1 July 2023
	Tier	9
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1. PRODUCT DESCRIPTION

1.a General description of the product

Strainers are elements of pipelines, intended to remove larger, unwanted suspended particles that are visible in conveying media, primarily to protect downstream equipment (like pumps) from damage.

1.b Application limitations†

These Technical Requirements apply to strainers intended to be installed in the piping systems of Class III as defined by IACS UR P2.2 Rev. 4 November 2001.

These Technical Requirements are not applicable for:

- a) strainers intended for toxic and corrosive media, ammonia, liquefied gases, flammable media heated above its flash point or having a flash point below 60°C;
- b) strainers for cargo lines for gas and chemical tankers for other medias as indicated in note 6 UR P2.2 table 1;
- c) strainers made of plastic materials;
- d) strainers which may be considered as a pressure vessel by its design under following operating boundary limits:
 - filled fully or partially with gas or vapour at working pressure $P_w \geq 0.07$ MPa AND internal volume $V \geq 0.025$ m³, OR $P_w \times V \geq 0.03$ MPa×m³.
 - all strainers having design pressure $P > 1.75$ MPa, OR body thickness $t_A > 15$ mm, OR design temperature $T > 150$ °C, OR $P \times t_A > 15$ MPa × mm;
 - for strainers having design pressure $P \leq 1.75$ MPa, all those having internal diameter ID > 150 mm AND one of the following:
 - $P > 0.69$ MPa, OR

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- $P > 0.1$ MPa AND $V > 0.14$ m³ AND [$T > 66^{\circ}\text{C}$ (fuel oil) OR $T > 90^{\circ}\text{C}$ (other oils) OR $T > 149^{\circ}\text{C}$ (other fluids)]
- other boundary limits which may require a design appraisal prior to manufacture and testing;
- e) the filters in general (intended to remove very small suspended particles that are normally not visible in conveying media)

†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

Limited to Class III piping systems as defined by IACS UR P2.2 Rev. 4 November 2001, with following exceptions:

- a) piping systems conveying toxic and corrosive media, ammonia, liquefied gases flammable media heated above its flash point or having a flash point below 60°C ;
- b) piping for cargo lines for gas and chemical tankers for other medias as indicated in note 6 UR P2.2 table 1;
- c) bilge branch suction piping in general

1.d System context

As per item 1.c.

2. DESIGN EVALUATION

2.a Engineering evaluation requirements

2.a i. Technical Requirements

- a) Strainers 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;

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- b) Strainers shall be designed and manufactured in accordance with recognized standards such as ISO standards, API specifications, ASME Code, etc., and permanently marked as per referenced standard;
- c) Strainers shall be designed so as to prevent the loosening of covers (if any) when they are in use;
- d) The direction of flow shall be clearly and legibly marked on the strainer. The direction may be cast into the strainer housing;
- e) Strainers shall be fitted with nameplates to indicate their purpose(s);
- f) Where required for specific piping system, strainers can be configured in a duplex design, allowing one strainer to be cleaned while the other is still operational;
- g) Where strainers are intended for pressure lines with flammable fluids, the same precaution measures against fire are to be considered as for the filter:
Design and arrangement of filter intended for flammable liquids is to be such to avoid the possibility of them being opened inadvertently when under pressure. This may be achieved by either mechanically preventing the pressurised filter from being opened or by providing pressure gauges which clearly indicate the filter under pressure. Suitable means for pressure release and drain to a safe location are to be provided.

Materials:

- h) Strainer bodies are to be made of the material compatible with the piping systems intended to be installed in;
- i) The use of asbestos is prohibited;
- j) Aluminium and aluminium alloys are not permitted for use for casing of strainers for steam;
- k) The materials to be used for the mesh shall be suitable for the working medium and the intended service;
- l) Austenitic Stainless Steel is not to be used for sea water systems.

Type of connections:

Type of connections may be made by direct welding, flanges, or threaded joints, and should be to a recognised standard or of a design proven to be suitable for the intended purpose:

- m) Butt welded, slip-on sleeve and socket welding joints shall be used in the connecting of strainers;

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- n) Threaded joints shall be permitted for an outside diameter not exceeding 60.3 mm;
- o) Weld neck (butt-welded) flanges are permitted; slip-on flanges 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 DN80 mm; loose-flanged ends (unattached) are not permitted;
- p) 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.

- a) The standard used by the manufacturer shall be clearly identified in the documentation submitted;
- b) Assembly drawings showing dimensions, parts (strainer body, mesh dimensions and fineness), type of connections shall be submitted for EU RO review;
- c) 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);
- d) Product descriptions including nominal diameter, intended services, installation locations, intended fluids, working medium, rated flow, design pressure, temperature range, 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

- a) Type tests shall be carried out as per the referenced standard;
- b) Test specimens shall be selected from the production line or 'at random' from stock; †
- c) Where there are various sizes of the type of strainer requiring approval, a minimum of three separate sizes representative of the range from each type of

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joints (minimum, middle and maximum nominal diameter) shall be subject to the hydrostatic test at the following value of pressure:

$$P_H = 1.5 \times P, \text{ but not less than } 0.5 \text{ MPa}$$

where P_H = test pressure (MPa), P = design pressure (MPa) or the pressure indicated by the referenced standard for strainers, whichever is the largest;

- d) Tightness testing shall be carried out at the test pressure of 1.1 times the design pressure;
- e) Type tests 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 <https://www.euomr.org/technical-requirements>)

2.c Type testing requirement 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);
- b) All strainer bodies having a design pressure greater than 0.1 MPa shall be subject to a hydrostatic test at the following value of pressure:
 $P_H = 1.5 \times P, \text{ but not less than } 0.5 \text{ MPa};$
where P_H = test pressure (MPa), P = design pressure (MPa);
- c) After assembly, the strainer 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.

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4. MARKING REQUIREMENTS

Manufacturers of the approved equipment are, in principle, to mark the product before shipment for identification of approved equipment and, in addition, at least the following items to be marked at the suitable place:

- a) Manufacturer's name or equivalent;
- b) Type No. or symbol;
- c) 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 EU RO MR Type Approval Certificate Information.

The following information is specifically applicable to products relevant to this Technical Requirement and shall be included on the EU RO MR Type Approval Certificate:

- a) Certificate Heading;
- b) Certificate number;
- c) Company Information;
- d) Product Information;
- e) Term of Validity;
- f) Rules & Standards;
- g) Generic Sentence.

6. APPROVAL DATE AND REVISION NUMBER

Date	Revision	Comment
2021-07-01	0.0	Approved by EU RO MR Steering Committee
2023-01-01	0.1	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;
- c) ASME B16.34;
- d) JIS F7220, JIS F7222;

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- e) EN 1092-2, EN 558-1, EN 12266-1;
- f) DIN 3202/1, DIN 3230;
- g) BS 5154 and ISO 5208

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@euomr.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: <https://www.euomr.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.

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