

# EU RO Mutual Recognition Technical Requirements

<b>CLASS III PIPES FITTINGS (DY≤500 mm)</b>	Version	0.3
	Adoption Date	1 April 2016
	Application Date	1 October 2016
	Tier	2
This document is subject to controlled issue and can be found here: <a href="http://www.euromr.org/technical-requirements">http://www.euromr.org/technical-requirements</a> <b>*** Uncontrolled if downloaded or printed ***</b>		

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 .....	7
7. BACKGROUND INFORMATION / REFERENCES .....	7
8. MAINTENANCE / CLARIFICATION OF TECHNICAL REQUIREMENTS .....	7

## 1. PRODUCT DESCRIPTION

### 1.a General description of the product

Fittings are pipelines formed components bends, elbows, tees, plugs, reducers, diameter change transition pieces, adapters, caps etc., and other elements of pipelines, intended for pipelines branching and changing of conveying medium direction.

### 1.b Application limitations

These Technical Requirements apply to Class III pipes fittings as defined by IACS UR P2.2 Rev. 4 November 2001.

These Technical Requirements are not applicable for:

- fittings intended for toxic and corrosive media, ammonia, liquefied gases, flammable media heated above its flash point or having a flash point below 60°C;
- cargo and venting lines for gas and chemical tankers, but can used in open ended piping (drains, overflows, vents, exhaust gas lines, boiler escape pipes) for another medias as indicated in note 6 UR P2.2 **table 1**;
- fittings fitted on the ship's side and collision bulkhead;
- plastic fittings.

# EU RO Mutual Recognition Technical Requirements

<b>CLASS III PIPES FITTINGS (DY≤500 mm)</b>	Version	0.3
	Adoption Date	1 April 2016
	Application Date	1 October 2016
	Tier	2
This document is subject to controlled issue and can be found here: <a href="http://www.euromr.org/technical-requirements">http://www.euromr.org/technical-requirements</a> <b>*** Uncontrolled if downloaded or printed ***</b>		

## 1.c Intended use

- a) Piping system for steam with design pressure up to 0,7 MPa and design temperature up to 170°C. Limited to Class III piping systems as defined by IACS UR P2.2 Rev. 4 November 2001;
- b) Piping system for thermal oil with design pressure up to 0,7 MPa and design temperature up to 150°C;
- c) Piping system for fuel oil, lubricating oil and flammable hydraulic oil with design pressure up to 0,7 MPa and design temperature up to 60°C;
- d) Piping system for water, air, non-flammable gases and hydraulic fluids with design pressure up to 1,6 MPa and design temperature up to 200°C;
- e) For open-ended pipes (drains, overflows, vents, exhaust gas lines, boiler escape pipes) irrespective of design temperature;
- f) For cargo oil pipes.

## 2. DESIGN EVALUATION

### 2.a Engineering evaluation requirements 2.a i.

#### Technical Requirements

##### Design

- a) Fittings in piping systems shall be compatible with the pipes to which they are attached and to be suitable for the medium and service for which they are intended. Permissible operating pressure and temperature of fittings shall be determined in accordance with national or international codes or standards and it should be guaranteed by the manufacturer of the fitting;

##### Materials

- b) Fittings should be made from the following materials: carbon and carbon-manganese steel, special alloy steel, copper and copper alloy, nodular cast iron and grey cast iron. The materials to be used for the various fittings shall be suitable for the medium and service for which the piping is intended. Nodular iron castings for fittings in Class III piping systems shall be made in a grade having a specified minimum elongation not less than 12 per cent on a

# EU RO Mutual Recognition Technical Requirements

<b>CLASS III PIPES FITTINGS (DY≤500 mm)</b>	Version	0.3
	Adoption Date	1 April 2016
	Application Date	1 October 2016
	Tier	2
This document is subject to controlled issue and can be found here: <a href="http://www.euromr.org/technical-requirements">http://www.euromr.org/technical-requirements</a> <b>*** Uncontrolled if downloaded or printed ***</b>		

gauge length of  $5,65\sqrt{S_0}$ , where  $S_0$  is the actual cross-sectional area of the test piece.

For the use in pipe class III piping systems a material approval according to recognized standards is required;

- c) Grey cast iron shall not be used for the following pipe fittings:
- i. boiler blow-off systems;
  - ii. pipelines for steam;
  - iii. fire extinguishing;
  - iv. bilge and ballast systems;
  - v. fitted on the external walls of fuel oil tanks or lubrication oil tanks that are subjected to the static head of internal fluid;
  - vi. mounted on shell plating or sea chest;
  - vii. mounted onto collision bulkheads;
  - viii. cargo oil piping systems with a design pressure over 1.6MPa;
  - ix. provided at the ship/shore connection of a flammable liquid cargo line.

## Types of connections

- d) Butt welded, slip-on sleeve and socket welded joints shall be used in connection of pipes and fittings;
- e) The dimensions of flanges and relative bolts shall be chosen in accordance with the national standards. Flange attachments shall be in accordance with national or international standards that are applicable to the piping system and shall recognize the boundary fluids, design pressure and temperature conditions, external or cyclic loading and location;
- f) Slip-on threaded joints having pipe threads where pressure-tight joints are made on the threads with parallel or tapered threads, shall comply with requirements of a recognized national or international standard. Slip-on threaded joints may be used in piping system except for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur. Threaded joints fitting with tapered thread shall be allowed for pipes with outside diameter not more than 60.3 mm. Slip-on threaded joints with parallel threads (straight-thread joints) are

# EU RO Mutual Recognition Technical Requirements

<b>CLASS III PIPES FITTINGS (DY≤500 mm)</b>	Version	0.3
	Adoption Date	1 April 2016
	Application Date	1 October 2016
	Tier	2
This document is subject to controlled issue and can be found here: <a href="http://www.euromr.org/technical-requirements">http://www.euromr.org/technical-requirements</a> <b>*** Uncontrolled if downloaded or printed ***</b>		

only acceptable if with O-ring sealing for connection to hydraulic equipment, but shall not be used for joining sections of pipe.

## 2.a.ii. *Technical documents to be submitted*

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

The following documentation shall be submitted by the Manufacturer before type testing:

- a) Fitting dimensions;
- b) Maximum internal and external working pressure;
- c) Working temperature range;
- d) Intended services and installation locations;
- e) Intended fluids;
- f) Details of marking;
- g) All relevant design drawings, catalogues, data sheets, calculations and functional descriptions;
- h) Certificates and reports of relevant tests previously carried out;
- i) Details of relevant standards;
- j) Fully detailed sectional assembly drawings showing fittings and pipe connections;
- k) Details of fitting's materials.

## 2.b *Type testing requirements*

- a) The request for type approval shall be submitted by the Manufacturer or by the Applicant, if authorized by the Manufacturer.
- b) Type tests shall be in accordance with applicable standards. Test specimens shall be selected from production line or at random from stock†. Where there are various sizes from type of fittings requiring approval, minimum of three separate sizes representative of the range, from each type of joints shall be subject to the hydrostatic test at the following value of pressure:

$$PH = 1,5P$$

where PH = test pressure (bar),

P = design pressure (bar).

# EU RO Mutual Recognition Technical Requirements

<b>CLASS III PIPES FITTINGS (DY≤500 mm)</b>	Version	0.3
	Adoption Date	1 April 2016
	Application Date	1 October 2016
	Tier	2
This document is subject to controlled issue and can be found here: <a href="http://www.euomr.org/technical-requirements">http://www.euomr.org/technical-requirements</a> <b>*** Uncontrolled if downloaded or printed ***</b>		

- c) Tests shall be carried out in the presence of the EU 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 <http://www.euomr.org/Guidance%20for%20Mutual%20Recognition>)

## 3. PRODUCTION REQUIREMENTS

### 3.a. General requirements

Refer to EU RO "Product Quality Assurance (PQA)" procedure (Appendix VI of EU RO Framework Document for the Mutual Recognition of Type Approval).

### 3.b. Special requirements

All fittings for steam pipes, feed pipes, compresses air pipes and fuel oil pipes having a design pressure greater than 3,5 (bar) shall be subject to a hydrostatic test at the following value of pressure:

$$PH = 1,5P$$

where PH = test pressure (bar), but in no case less than 4 bar,

P = design pressure (bar).

Hydrostatic test can be carrying out together with pipes after assembly or separate.

# EU RO Mutual Recognition Technical Requirements

<b>CLASS III PIPES FITTINGS (DY≤500 mm)</b>	Version	0.3
	Adoption Date	1 April 2016
	Application Date	1 October 2016
	Tier	2
This document is subject to controlled issue and can be found here: <a href="http://www.euromr.org/technical-requirements">http://www.euromr.org/technical-requirements</a> <b>*** Uncontrolled if downloaded or printed ***</b>		

## 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 logo;
- b) Type designation;
- c) Size;
- d) Pressure ratings;
- e) The design standards that the fitting is manufactured in accordance with;
- f) The material of which the pipe or fitting is made;
- g) Year/ serial number.

Where the size of the fitting precludes inclusion of all of the above, the manufacturer's name or logo and batch number shall be marked on the fitting whilst the other information can be provided on the product certificates.

## 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 relevant EU RO MR Type Approval Certificate:

- a) Product descriptions – Product, Model, Pressure and Temperature Range, Description, Material Designation, Intended Service, Ratings, Restrictions.

# EU RO Mutual Recognition Technical Requirements

<b>CLASS III PIPES FITTINGS (DY≤500 mm)</b>	Version	0.3
	Adoption Date	1 April 2016
	Application Date	1 October 2016
	Tier	2
This document is subject to controlled issue and can be found here: <a href="http://www.euomr.org/technical-requirements">http://www.euomr.org/technical-requirements</a> <b>*** Uncontrolled if downloaded or printed ***</b>		

## 6. APPROVAL DATE AND REVISION NUMBER

Date	Revision	Comment
2013-04-30	0.0	Accepted by Advisory Board
2014-01-31	0.1	CRF008 - Reference to EU RO Framework Document for the Mutual Recognition of Type Approval added.
2015-01-31	0.2	CRF018 – Revision to par. 2.a.ii - Test results to be in English; CRF020 – Revision to par. 5 - 'Type Approval Certificate Content'.
1 April 2016	0.3	CRF025 – Updated to new MR TR document format incl. par. 8; CRF026/026a – Witness testing & control of test specimen; CRF028 – addition of 6 month application clause.

## 7. BACKGROUND INFORMATION / REFERENCES

- a) IACS UR P2
- b) EU RO Framework Document for the Mutual Recognition of Type Approval.

## 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](mailto: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: <http://www.euomr.org/Guidance%20for%20Mutual%20Recognition>.

- END -