

EU RO Mutual Recognition Technical Requirements

CORROSION-RESISTANT PAINTS	Version	0.0
	Adoption Date:	01 January 2022
	Application Date:	01 July 2022
	Tier	9
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1. PRODUCT DESCRIPTION

1.a General description of the product

Paints or paint systems intended for the corrosion protection of steel structures.

1.b Application limitations[†]

These technical requirements apply to the paints or paint systems intended for primer coating or for corrosion protection of steel plates and sections.

These technical requirements are not covering the protective coating systems specified by IMO Resolutions MSC 215(82) and MSC 288(87).

These technical requirements are not covering weldable shop primer.

[†]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

Paints or paint systems intended for the corrosion protection of steel structures and corrosion protection of aluminium.

1.d System context

Refer to item 1.c.

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2. DESIGN EVALUATION

2.a Engineering evaluation requirements

2.a i. Technical Requirements

Paints or paint systems intended for the corrosion protection shall be manufactured so that the type testing requirements indicated in the para. 2.b. are to be complied with.

2.a.ii. Technical documents to be submitted

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

- a) Compositions for every brand of products, including:
 - i. Product name and identification mark and/or number;
 - ii. Materials, components and composition of the coating system, colours;
 - iii. Material Safety Data Sheet
- b) Manufacturer's instructions and recommendations for use, including:
 - i. Surface preparations,
 - ii. Mixing and agitation,
 - iii. Number and nominal dry thickness of coat,
 - iv. Method of application,
 - v. Drying condition and overcoating intervals,
 - vi. Limitations,
 - vii. Storage

2.b Type testing requirements

- a) Paint or paint systems are to be tested in accordance with the requirements given in Table 1 and Table 2.
- b) Three specimens are to be tested for each test. Two of the three test specimens shall comply with the requirements specified in Table 1 and Table 2.
- c) Test specimens shall be prepared with the paints selected from production line or at random from stocks.†
- d) Approval test for the paint of the brand for approval are to be carried out in the presence of the EU RO Surveyor at the manufacturing plant. In cases where the tests are conducted at Nationally Accredited Laboratories, the presence of the EU RO surveyor may be omitted.†

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Table 1. Test methods for assessing the resistance of paint coatings to detachment from the metallic substrate

Test item	Test condition and procedure	Acceptance criteria	Remarks
Cross-cut test	ISO 2409:2020 - Dimension of test specimen : 150 mm × 75 mm × 3 mm	Classification 0 to 2	If the dry film thickness of the paint system is less than or equal to 250 µm, the test procedure is to be compliant with standard ISO 2409.
Pull-off test for adhesion	ISO 4624:2016 - Dimension of test specimen : 150 mm × 75 mm × 3 mm	Minimum pull-off value of 2.5 MPa for each measurement 0 % adhesive failure between steel/metalized steel respectively and the first coat (unless pull-off values are at least 5 MPa)	ISO 4624 should be used if the dry film thickness of the paint system is greater than 250 µm.
Cupping test	ISO 1520:2006 - Dimension of test specimen : 100 mm × 90 mm × 0.8 mm Each test specimen is to be tested using 6 mm depth of indentation.	Peeling-off area is to be within 1.0 cm ² .	

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Falling ball impact test	- Dimension of test specimen : 200 mm × 100 mm × 4 mm - A mild steel test specimen coated on one side is to be fixed on a steel base with the painted surface facing upwards and subjected to falling ball impact test with a weight of 300 g dropped thrice from a height of 2.4 m. Thereafter the condition of the paint surface is to be checked after leaving the test panel at room temperature for a period of one hour.	No cracks No peelings	
Bend test	ISO 1519:2011 - Dimension of test specimen : 150 mm × 50 mm × 0.3 mm	No cracks No peelings	

Table 2. Laboratory performance test for corrosion protection of steel structures by protective paint systems

Test item	Test conditions and methods	Assessment methods	Acceptance criteria	Remarks
Water immersion	ISO 2812-2:2018 - Test duration: 3000 hr - Water : sodium chloride , 5%(mass fraction) aqueous solution - Dimension of test specimen : 300 mm X 150 mm X 2 mm	ISO 4628-2 (Blistering) ISO 4628-3 (Rusting) ISO 4628-4 (Cracking) ISO 4628-5 (Flaking)	0 (S0) Ri 0 0 (S0) 0 (S0)	
Water condensation	ISO 6270-1:2017 - Test duration: 720 hr - Dimension of test specimen : 150 mm X			

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	100 mm X 2 mm (Thicker specimens can be used for condensation testing up to 8 mm)			
Salt spray test	ISO 9227:2017 (Neutral salt spray test) - Test duration: 1440 hr - Test specimen (3ea) for corrosion: A scribe line shall be made on each test specimen in accordance with Annex A of ISO 12944-6:2018 - Test specimen (3ea) for cross-cut test or pull-off test - Dimension of test specimen : 150 mm X 100 mm X 2 mm (Thicker specimens can be used for condensation testing up to 8 mm)	Corrosion at scribe after salt spray test (ISO12944-6, Annex A.2)	Max. 1,5 mm corrosion at scribe as average value	
		Cross-cut test (ISO 2409:2020)	Classification 0 to 2	- Only if the dry-film thickness of the paint system is less than or equal to 250 µm - Assessment after 7 d in standard atmosphere as defined in ISO 3270
		Pull-off test (ISO 4624:2016)	- Minimum pull-off value of 2,5 MPa for each measurement - 0 % adhesive failure between	- After 7 d reconditioning in a standard atmosphere as defined in ISO 3270

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			steel/metalized steel respectively and the first coat (unless pull-off values are at least 5 MPa)
Cathodic disbonding	ISO 15711:2003, method A - Test duration : 26 weeks - Test specimen : An artificial holiday of diameter 6 mm shall be made on each test specimen in accordance with ISO 15711:2013 - Dimension of test specimen : 300 mm X 150 mm X 2mm	Calculate the disbonded area as the difference between the total area exposed and the area of the holiday. (ISO12944-9)	The equivalent diameter of the disbonded area shall be not more than 20 mm.
Cyclic ageing test	ISO12944-6:2018 (Annex B) - Test duration: 1680 hr - Test specimen (3ea) for corrosion: A scribe line shall be made on each test specimen in accordance with Annex A of ISO 12944-6:2018 - Test specimen (3ea) for cross-cut test or pull-off test - Dimension of test specimen :150 mm x 75 mm x 3 mm	Corrosion at scribe after cyclic ageing test (ISO12944-6, Annex A.2)	Max. 3,0 mm corrosion at scribe as average value
		Cross-cut test (ISO 2409:2020)	Classification 0 to 2 - Only if the dry-film thickness of the paint system is less than or equal to 250 µm - Assessment after 7 d in

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			standard atmosphere as defined in ISO 3270
		Pull-off test (ISO 4624:2016) - Minimum pull-off value of 2,5 MPa for each measurement - 0 % adhesive failure between steel/metalized steel respectively and the first coat (unless pull-off values are at least 5 MPa)	- After 7 d reconditioning in a standard atmosphere as defined in ISO 3270

† 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

If the specified standard(s) is (are) amended or revised, the product is to be re-approved prior to it being supplied to vessels to which the amended standards apply.

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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 <https://www.euomr.org/technical-requirements>

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 designation;
- c) Lot No. and date of manufacture;
- d) Storage location.

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

7. BACKGROUND INFORMATION / REFERENCES

- a) EU RO Framework Document for the Mutual Recognition of Type Approval;

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- b) ISO 2409 - Paints and varnishes - Cross-cut test
- c) ISO 1520 - Paints and varnishes — Cupping test
- d) ISO 1519 - Paint and varnishes - Bend Test (Cylindrical Mandrel)
- e) ISO 9227 - Corrosion tests in artificial atmospheres — Salt spray tests
- f) ISO 2812-2 - Paints and varnishes — Determination of resistance to liquids — Part 2: Water immersion method
- g) ISO 4624 - Paints and varnishes — Pull-off test for adhesion
- h) ISO 6270-1 - Paints and varnishes — Determination of resistance to humidity — Part 1: Condensation (single-sided exposure)
- i) ISO 12944-6 - Paints and varnishes — Corrosion protection of steel structures by protective paint systems —Part 6 : Laboratory performance test methods
- j) ISO 4628-2 - Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering
- k) ISO 4628-3 - Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting
- l) ISO 4628-4 - Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 4: Assessment of degree of cracking
- m) ISO 4628-5 - Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 5: Assessment of degree of flaking
- n) ISO 12944-9 - Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 9 : Protective paint systems and laboratory performance test methods for offshore and related structures
- o) ISO 15711 - Paints and varnishes — Determination of resistance to cathodic disbonding of coatings exposed to sea water

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.

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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>

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