

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Abrasion resistant coatings**with type designation(s)
Marathon IQ2

Issued to

Jotun A/S
SANDEFJORD, Norway

is found to comply with

DNV GL class programme DNVGL-CP-0293 – Type approval – Abrasion resistant coatings**Application :****Abrasion resistant coating.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2018-10-22**This Certificate is valid until **2023-10-21**.for **DNV GL**DNV GL local station: **Sandefjord**Approval Engineer: **Stefan Marion**

Rikard Törnqvist
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Job Id: **262.1-029796-1**
Certificate No: **TAK00001CG**

Product description

Marathon IQ2, a two-component high build, solvent free polyamine cured epoxy coating.

Colors: selected range of colours
Dry Film Thickness: Min. 500 µm (in one coat)
Surface cleanliness: Min. Sa 2½ (ISO 8501-1)
Surface profile: 75 - 150 µm

Manufactured by

Jotun Paints (Europe) Ltd., Stather Road, Flixborough, Scunthorpe, North Lincolnshire, DN15 8RR, England, United Kingdom

DNV GL local station: Manchester

Responsibility

The Company (stated on the front page of this Certificate) takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Application/Limitation

Specially suited in areas where high scratch resistance is required. Specially designed for ice-going vessels including ice breakers. May be used as anode shield around ICCP anodes.

This approval is based on laboratory tests.

With reference to DNVGL-RU-SHIP Pt.6 Ch.6 Sec.2 the thickness of steel plates in the ice belt may be reduced if an abrasion resistant coating is applied and maintained.

This approval is solely connected to the corrosion prevention and abrasion resistant properties of the coating material. The approval does not include any evaluation of toxicity, contamination, pollution, or fire technical properties.

Surface preparation and coating application as per manufacturer's recommendations (Application Guide). The durability of the applied coating system will depend on the steel surface preparation, coating application and the environmental conditions.

The Type Approval Certificate is invalid if the formulation of product is changed to a degree deemed significant by DNV GL.

Type Approval documentation

Tests carried out

Tests carried out in accordance with **Type Approval documentation**.

Test Results according to DNVGL CP-0293:

<i>Test description</i>	<i>Standard reference</i>	<i>Results</i>
Cyclic ageing resistance	ISO 12944-9	
Water immersion test	ISO 12944-9/ISO 2812-2	
Cathodic disbondment	ISO 12944-9/ISO 15711	
Abrasion resistance	ASTM D4060	

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Impact resistance	ISO 6272	
Ice friction coefficient	Acer Arctic test procedure	
Fixed radii mandrel bend test	NACE TM0104	

Marking of product

Product/package shall be marked with *manufacturer's name and address*; **Jotun AS**, *place of production, type designation*; **Marathon IQ2**, and *date of production/batch number*.

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV GL Type Approval Certificate.

Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical Assessment to be performed after 2 and 3.5 years (Certificate Retention) and at renewal after 5 years (Certificate Renewal).

The main elements of the Periodical Assessment are to:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and DNV GL Type Approval Certificate.

END OF CERTIFICATE