DNV·GL

Certificate No:
TAK00000D9

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Protective Coating Systems - Seawater Ballast Tanks

with type designation(s)
HEMPADUR QUATTRO XO 17720

Issued to
Hempel A/S
Kgs. Lyngby, Denmark

is found to comply with
DNV GL class programme DNVGL-CP-0108 – Type approval – Protective coating systems for seawater ballast tanks and double-side skin spaces
IMO Resolution MSC.215(82) Performance Standard for Protective Coatings (PSPC)
IACS Unified Interpretations SC223. For Application of SOLAS Regulation II-1/3-2 Performance Standard for Protective Coatings (PSPC) for Dedicated Seawater Ballast Tanks in All Types of Ships and Double-side Skin Spaces of Bulk Carriers.

Application :

For use in ballast tanks, double-skin spaces, cofferdams and similar areas. Surface preparation and coating application as per PSPC or manufacturer's recommendations, whichever is stricter.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **2019-06-30**.

Issued at **Høvik** on **2016-06-23**

for **DNV GL**

DNV GL local station: **Copenhagen**

Approval Engineer: **Gisle Hersvik**

Arnstein Gloppen
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.

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Product description

HEMPADUR QUATTRO XO 17720, two-component, epoxy based coating for corrosion protection of steel surfaces.

Manufactured by

Hempel (Yantai) Coatings Ltd., No.12 Zhujiang Road, Economic & Tech Development Zone, Yantai 264006, Shangdong Province, P.R. China

DNV GL local office: Qingdao

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

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

HEMPADUR QUATTRO XO 17720 is approved for application on blast cleaned surfaces and on prequalified shop primed surfaces. The following shop primers have been prequalified:

HEMPEL's SHOPPRIMER ZS 15890	[Hempel A/S]
HEMPEL's SHOPPRIMER ZS 15820	[Hempel A/S]
SD Zinc Primer 1000HA(S)	[COSCO Kansai Paint & Chemicals]
W53-2	[Taicang Lanyan Deck Dressing & Coating Co., Ltd.]
CD-SG906	[Haidun Coating (Ningbo) Co., Ltd.]
WS-01	[Jingjiang Hengyu Chemical Machinery Co., Ltd.]
Yuxiang 0317	[Yuecheung Chemical (Dalian) Co., Ltd.]
725-E47	[Xiamen Sunrui Ship Coatings Co., Ltd.]
TH-2	[Yejian New-Material Co., Ltd.]
F-6001	[JiangxiSheng Jingcheng Industrial Co., Ltd.]
Cerabond 2000	[Chugoku Marine Paints]

Surface preparation and coating application as per PSPC or manufacturer's recommendations, whichever is stricter.

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 the epoxy coating **HEMPADUR QUATTRO XO 17720** is changed to a degree deemed significant by DNV GL. If the formulation of any of the listed pre-qualified shop primers is changed to a degree deemed significant by DNV GL that shop primer cannot be used as part of the Protective Coating System.

Type Approval documentation

1.
2.
3.

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**. The tests reported in the Test and Verifying Center for Ship Materials on Coatings and Paintings – and in DNV-CCS Technology Institute Reports are carried out according to the procedures in IMO Resolution MSC.215(82) Performance Standard for Protective Coatings (PSPC), ref. IACS UI SC223.

- Test Report No. JX14287 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on Hempel's Shopprimer ZS 15890" of 2014-10-25.
- Test Report No. JX14220 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on Hempel's Shopprimer ZS 15820" of 2014-09-15.
- Test Report No. JX14164 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on SD ZINC PRIMER 1000HA(S)" of 2014-09-15.
- Test Report No. JX14170 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on 725-E47 inorganic zinc silicate shop primer" of 2014-09-05.
- Test Report No. JX14178 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on TH-2 zinc silicate shop primer" of 2014-09-05.
- Test Report No. JX14184 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on W53-02 Inorganic zinc shop primer" of 2014-09-05.
- Test Report No. JX14196 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on CD-SG906 inorganic zinc silicate shop primer" of 2014-09-05.
- Test Report No. JX14321 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on WS-01 inorganic zinc silicate shop primer" of 2014-11-07.
- Test Report No. JX14327 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 (2*160 µm) on inorganic zinc silicate shop primer 0317" of 2014-11-07.
- Test Report No. JX15422 from Test and Verifying Center for Ship Materials on Coatings and Paintings "Hempadur Quattro XO 17720 on F-6001 inorganic zinc silicate shop primer" of 2015-11-22.
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15B049 , "Ballast Tank Coating Test of 2x160 µm Hempadur Quattro XO 17720 on Cerabond 2000 Inorganic Zinc Shop Primer" of 2015-11-11.

Marking of product

Product/package shall be marked with *manufacturer's name and address***; Hempel A/S**, *place of production***,** *type designation*; **HEMPADUR QUATTRO XO 17720**, 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 two (2) years (Certificate Retention) and at renewal after four (4) 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 the DNV GL Type Approval Certificate.

END OF CERTIFICATE