DNV·GL

Certificate No:
TAK00000DA

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Protective Coating Systems - Cargo Oil Tanks

with type designation(s)
HEMPADUR 15600

Issued to
Hempel A/S
Kgs. Lyngby, Denmark

is found to comply with
DNV GL class programme DNVGL-CP-0139 – Type approval – Protective coating systems for cargo oil tanks
IMO Resolution MSC.288(87) Performance Standard for Protective Coatings (PSPC)
IACS Unified Interpretations SC259. For Application of SOLAS Regulation II-1/3-11 Performance Standard for Protective Coatings for Cargo Oil Tanks of Crude Oil Tankers (PSPC-COT), adopted by Resolution MSC.288(87).

Application :

For use in cargo oil tanks of crude oil tankers. 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 **2020-06-23**.

Issued at **Høvik** on **2016-06-24**

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 15600, two-component, epoxy based coating for corrosion protection of steel surfaces.

Manufactured by

Hempel (Guangzhou) Coatings Ltd., No.3 Canghai 4th Road, Yonghe Economic District, Guangzhou Economic & Technology Development District, Guangzhou, P.R. China

DNV GL local office: Guangzhou

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 15600 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 15820	[Hempel A/S]
HEMPEL's SHOPPRIMER ZS 15890	[Hempel A/S]
Cerabond 2000	[Chugoku Samhwa Paints Ltd.]
MUKI Z 2001	[Jotun A/S]
Galvany Shopprimer IZ182(J)	[KCC Corp]
SigmaWeld 165 (Sigma Proferral MC)	[PPG SSC Co., Ltd. / Sigma Coatings]
725-E47	[Xiamen Shuangrui Ship Coating Co., Ltd.]
WS-01	[Jingjiang Hengyu Chemical Machinery Co., Ltd.]
W53-02	[Taicang City Lanyan Deck Covering & Coating Co., Ltd.]
CD-SG906	[Ningbo Haidun Coating Co., Ltd.]
SD Zinc Primer 1000 HA(S)	[COSCO KANSAI Paint & Chemicals (Tianjin) Co., Ltd.]
TH-2	[Yejian New Material Co., Ltd.]
F-6001	[Jiangxi Sheng Jingcheng Industrial Co., Ltd.]

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 15600** 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.
4.

Tests carried out

Type Testing carried out according to **Type Approval documentation**. The tests reported by COT bv and CCS-DNV Technology Institute are carried out according to the procedures in IMO Resolution MSC.288(87) Performance Standard for Protective Coatings (PSPC). The tests reported by DNV Bergen are carried out according to the procedures in IMO Resolution MSC.215(82) Performance Standard for Protective Coatings (PSPC);

- COT bv Test Report No. LAB12-0236-REP, Issue 2 "CRUDE OIL TEST Hempadur 15600 (XA354/XA377) on Sa 2½ blasted steel" of 2012-05-30.
- COT bv Test Report No. LAB12-0243-REP, Issue 2 "CRUDE OIL TEST Hempadur 15600 (XA354/XA377) on Hempel's Shopprimer ZS 15890" of 2012-05-30.
- DNV Technical Report No. 2013-5011/143YTS0-16, Rev. 00 "Ballast tank coating testing of Hempadur 15600 on Hempel's shop primer ZS15890" of 2013-01-22.
- DNV Technical Report No. 2013-5021 / 143YTS0-22, Rev. 00 "Crossover test of HEMPADUR 15600 on HEMPEL'S SHOPPRIMER ZS15820" of 2013-01-30.
- DNV Technical Report No. 2013-5026 / 143YTS0-27, Rev. 00 "Crossover test of HEMPADUR 15600 on CERABOND 2000 shop primer" of 2013-02-13.
- DNV Technical Report No. 2013-5034 / 143YTS0-35, Rev. 00 "Crossover test of HEMPADUR 15600 on MUKI Z 2001 shop primer" of 2013-02-19.
- DNV Technical Report No. 2013-5038 / 143YTS0-39, Rev. 00 "Crossover test of HEMPADUR 15600 on GALVANY SHOPPRIMER IZ182(J)" of 2013-03-07.
- DNV Technical Report No. 2013-5042 / 143YTS0-43, Rev. 00 "Crossover test of HEMPADUR 15600 on SIGMAWELD 165 shop primer" of 2013-03-07.
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15H002, Rev. 03 "Crude Oil Tank Coating Test of 2 * 160 µm HEMPADUR 15600 on HEMPEL'S SHOPPRIMER ZS 15890 Inorganic Zinc Shop Primer" of 2015-09-10. (Full test)
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15J007, Rev. 01 "Crude Oil Tank Coating Test of 2 * 160 µm HEMPADUR 15600 on HEMPEL'S SHOPPRIMER ZS 15820 Inorganic Zinc Shop Primer" of 2015-09-10. (Crossover test)
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15J001, Rev. 01 "Crude Oil Tank Coating Test of 2 * 160 µm HEMPADUR 15600 on 725-E47 Inorganic Zinc Shop Primer" of 2015-08-01. (Crossover test)
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15J002, Rev. 01 "Crude Oil Tank Coating Test of 2 * 160 µm HEMPADUR 15600 on WS-01 Inorganic Zinc Shop Primer" of 2015-08-01. (Crossover test)
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15J003, Rev. 01 "Crude Oil Tank Coating Test of 2 * 160 µm HEMPADUR 15600 on W53-02 Inorganic Zinc Shop Primer" of 2015-08-01. (Crossover test)
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15J004, Rev. 01 "Crude Oil Tank Coating Test of 2 * 160 µm HEMPADUR 15600 on CD-SG906 Inorganic Zinc Shop Primer" of 2015-08-01. (Crossover test)
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15J005R1, Rev. 01 "Crude Oil Tank Coating Test of 2 * 160 µm HEMPADUR 15600 on SD ZINC PRIMER 1000HA(S) Inorganic Zinc Shop Primer" of 2015-08-01. (Crossover test)
- CCS-DNV Technology Institute Technical Report No. CDTI-CL-15J006, Rev. 01 "Crude Oil Tank Coating Test of 2 * 160 µm HEMPADUR 15600 on TH-2 Inorganic Zinc Shop Primer" of 2015-09-10. (Crossover test)
- Test and Verifying Center for Ship Materials on Coatings and paintings Technical Report No. CDTI-CL-15J006, Rev. 01 "HEMPADUR 15600 (2*160 µm) on F-6001 Inorganic Zinc Silicate Shop Primer" of 2015-09-10. (Full test)

Marking of product

Product/package shall be marked with *manufacturer's name and address*; **Hempel (Guangzhou) Coatings Ltd., China** and *type designation*; **HEMPADUR 15600**, 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 years (Certificate Retention) and at renewal after 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