IMO PSPC COT

according to IMO Resolution MC.288(87)

Introduction

Adopted at the 87th session of the Maritime Safety Committee, Resolution MSC.288(87) Performance Standard for Protective Coatings (PSPC) for cargo oil tanks of crude oil tankers, aims to improve safety at sea by avoiding the effects of corrosion, thus enhancing the structural integrity of the vessel as a whole.

Aims to target a 15 year useful coating life for cargo oil tanks of crude oil tankers, classified as being in GOOD condition according to IMO Resolution A.744(18).

Scope

Cargo oil tanks during the construction of new crude oil tankers.

The resolution was made mandatory for ships whose building contracts were made on or after 1st January 2012.

Hempel products holding IMO PSPC COT approval according to IMO Resolution MSC.288(87) are:

- Hempadur 15400/15402
- Hempadur 15460
- Hempadur 15600
- Hempadur Quattro 17634
- Hempadur Quattro XO 17720
- Hempadur Quattro XO 17820
- Hempadur Quattro XO 17870

Coating System Requirements

- Epoxy based, light colour topcoat.
  (Other coating systems with performance according to the test procedure in the Resolution MSC.288(87)).
- Minimum of 2 spray applied coats + 2 stripe coats (some weld lines may allow 1 stripe coat if DFT is ok.)
- NDFT of 320µm with 90/10 rule. Maximum DFT according to manufacturer.
- Coating systems pre-qualified by testing or service experience.

Tripartite Agreement

The shipyard is responsible for implementation of the requirements of IMO PSPC during new construction. Before construction begins a TPA (Tripartite Agreement) on inspection procedures of the surface preparation and coating processes is agreed upon and signed by the owner, shipyard and coating producer.

Primary Surface Preparation

- Surface cleanliness – Sa2½ (ISO 8501-1)
- Surface profile – 30 – 75µm (ISO 8503-1/2)
- Total soluble salt limit – 50mg/m^2 NaCl (ISO 8502-9)
- Shop primer must have passed pre-qualification testing with an epoxy system. Be inhibitor free, zinc silicate based.
- Blasting should not occur if the relative humidity is >85% and/or the surface temperature of the steel is <3°C above the dew point.

Secondary Surface Preparation

- After steel plates and structural members are cut and welded into a block, all welds, defects and contamination are to be treated as per ISO 8501-2 P2.
- Sharp edges should be treated to a rounded radius of 2mm by three pass grinding or equivalent method.

The type and degree of secondary surface preparation depends upon the pre-qualification of the shop primer and damages caused during pre-construction.

- Intact shop primer from a pre-qualified system may be left, and only cleaned by high pressure fresh water washing or sweep blasting to remove any white rust or other contaminants from the surface.
- Non approved shop primer must be blasted to surface cleanliness Sa2 (ISO 8501-1) with 70% removal.
- Areas of damage and weld lines to be blasted to surface cleanliness Sa2½ (ISO 8501-1).

After erection, blocks will have been mostly painted, generally power tooling is not recommended after the block is blasted however it is allowable for erection joints or small areas of damage.

- For erection joints, power tool grinding to surface cleanliness St3 (ISO 8501-3) is allowable but blasting to Sa2½ (ISO 8501-1) is preferable where practical.
- Inner bottom
  - Power tool grinding to surface cleanliness St3 (ISO 8501-3) is allowable for damages up to 20% of the area to be coated.

  - Continuous damages >25m^2 or over 20% of the area to be coated shall be blasted to surface cleanliness Sa2½ (ISO 8501-1) and a surface profile of 30 – 75µm (ISO 8503-1/2).
- Underdeck
  - Power tool grinding to surface cleanliness St3 (ISO 8501-3) is allowable for damages up to 3% of the area to be coated.
  - Continuous damages >25m^2 or over 3% of the area to be coated shall be blasted to surface cleanliness Sa2½ (ISO 8501-1) and a surface profile of 30 – 75µm (ISO 8503-1/2).
- Blasting should not occur if the relative humidity is >85% and/or the surface temperature of the steel is <3°C above the dew point.
- The dust quantity rating is not to exceed quantity rating of 1 for dust classes 3, 4 and 5. For lower dust classes, dust must be removed if visible without magnification.

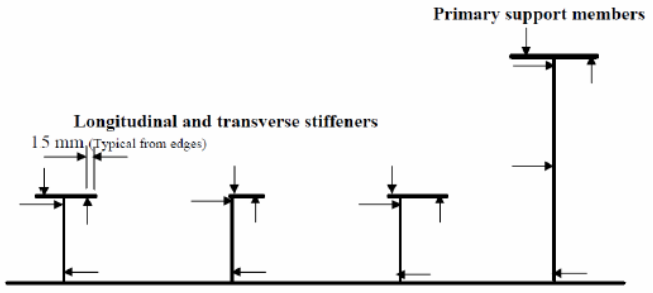
Application

- Minimum of 2 spray applied coats + 2 stripe coats (some weld lines may allow 1 stripe coat if DFT is ok).
- Stripe coats shall be applied by brush and roller. Roller to be used or scallops, rat holes, etc. only.
- Each main coating layer shall be appropriately cured prior to application of the next coat in accordance to manufacturers recommendations.
- Surface contaminants such as rust, grease, dust, salt, oil and abrasive inclusions to be removed prior to application.
- Coating manufacturers shall provide data on dry to re-coat times and walk-on times, these will be included in the job specification.

Inspection

Conducted by qualified and certified coating inspector(s): Hempel suggests that at least 2 years Marine related coating inspector experience with NACE CIP Level 2, Frosio Inspector Level III or equivalent.

- NDFT of 320µm with 90/10 rule – 90% of readings are >320µm, and none of the remaining 10% of readings is below 288µm (90% of 320µm).
- Non-destructive testing desired.
- Hempel recommends that
  - 1 reading per 5m^2 on a flat surface is carried out.
  - 1 set of readings per 2-3m along longitudinal, transverse member and primary support members are done
  - A set of readings can be classed as a 1 measurement on each face.



Coating Technical File

The Coating Technical File (CTF) is completed by the shipyard with approval from the Flag State, (Class Societies act as a RO). The CTF is kept on-board and maintained through the lifetime of the ship and must contain:

- type approval certificates of the coating systems used.
- technical datasheets
- shipyard records of coating application (including DFT measurements)
- coating log of Cl^- measurements.
- procedures for repair during construction.
- procedures for in-service maintenance and repair

Performance Testing

Existing Epoxy Coating Systems

- Existing epoxy coating systems prior to the date of entry into force of this standard shall meet one of the following requirements:
  - Testing in an external laboratory by a method corresponding to the test procedure in MSC 288(87) Annex 1 and 2 or equivalent, meeting as a minimum the requirements for rusting (Ri0) and blistering (no blisters). Successful testing will result in a Type Approval Certificate issued by the relevant classification society.
  - Documented field exposure (continuous trading with crude oil cargoes) for 5 years with a final coating condition of not less than "GOOD".

New Epoxy Coating Systems

- Epoxy coating systems approved on or after entry into force of this Standard shall meet the following requirement
  - Testing in an external laboratory by a method corresponding to the test procedure in MSC 288(87) Annex 1 and 2 or equivalent, meeting as a minimum the requirements for rusting (Ri0) and blistering (no blisters). Successful testing will result in a Type Approval Certificate issued by the relevant classification society.

Alternative (non epoxy) coating systems

- All systems that are not an epoxy-based system applied according to Table 1 in MSC 288(87) are defined as an alternative system. Acceptance of alternative systems shall be subjected to documented evidence that they ensure a

corrosion prevention performance at least equivalent to that indicated in MSC 288(87), by either:

- Testing in an external laboratory by a method corresponding to the test procedure in MSC 288(87) Annex 1 and 2 or equivalent, meeting as a minimum the requirements for rusting (Ri0) and blistering (no blisters). Successful testing will result in a Type Approval Certificate issued by the relevant classification society.
- Documented field exposure (continuous trading with crude oil cargoes) for 5 years with a final coating condition of not less than "GOOD".

This document is intended for professional use and provides generic advice in respect of the subject matter only. It is not intended to be used as a comprehensive guide. The buyer/applicator should always read the relevant Product Data Sheet ("**PDS**") and Safety Data Sheet ("**SDS**") relating to the Products ordered which are available for download on www.hempel.com. If in doubt, please contact your local Hempel representative for further advice. To the extent relevant, the disclaimer set out in the relevant PDS(s) applies to this document.