IMO PSPC Ballast Tanks

according to IMO Resolution MSC.215(82)

Introduction

Adopted at the 82nd session of the Maritime Safety Committee, Resolution MSC.215(82) Performance standard for protective coatings of dedicated seawater ballast tanks on all new ships and of double-sided skin spaces of bulk carriers, 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 ballast tanks, classified as being in GOOD condition according to IMO Resolution A.744(18).

Safety

Use adequate personal safety equipment and follow sound procedures. Apply only in well ventilated areas. Observe safety labels on packaging and paint containers and consult Hempel's Safety Data Sheets for the products to be applied.

Scope

Dedicated seawater ballast tanks, on all ships not less than 500GT and double sided skin spaces on bulk carriers of 150m and upwards.

The resolution was made mandatory for ships whose building contracts were made on or after 1st July 2008, or in the absence of a contract on all keels laid on or after 1st January 2009 or the delivery of which is on or after 1st July 2012.

Coating System Requirements

- Epoxy based, light coloured topcoat.
- 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

- Initial steel Rust Grade must be A or B. Rust Grades C & D are not recommended for new construction due to excessive pitting.
- 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 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 Sa2 (ISO 8501-1) with 70% removal.
- Areas of damage and weld lines to be blasted to 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 butt welded erection joint areas and small areas of damage.

- Power tool grinding is allowable on butt welded erection areas and welds for water tightness testing, blasting is preferred where it is practical, however total grinding should not exceed 2% of the total tank area.

- Power tool grinding on damaged areas is allowable for any contiguous coating damages of <25m^2 but not in excess of 2% of the total tank area.
- Power tooling should conform to a St 3 standard (ISO 8501-3)
- Contiguous areas >25m^2 and a total area in excess of 2% should be blasted to a cleanliness standard Sa2.5 (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 & 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 for scallops, rat holes.
- 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.

Individual details for Hempel IMO PSPC approved products can be find below;

Maximum DFT (Complete coating system)

The stated maximum DFT is for guidance actual DFT should be kept as close to the specified nominal DFT as possible. Frequent control of wet film thickness during application is recommended.

Product	Max DFT – <1% of total tank surface area.	Max. DFT – <5% of total tank surface area.
Hempadur 15600	1500µm / 60mils	1200µm / 48mils
Hempadur 17630/17633	2000µm / 80mils	1300µm / 52mils
Hempadur Quattro 17634	2000µm / 80mils	1300µm / 52mils
Hempadur Quattro XO 17720	1300µm / 52mils	900µm / 35mils
Hempadur Quattro XO 17820	2000µm / 80mils	1500µm / 60mils
Hempadur Quattro XO 17870	2500µm / 100mils	2000µm / 80mils
Hempadur Quattro XO 1787K	2500µm / 100mils	2000µm / 80mils
Hempadur BT 35750	1300µm / 52mils	900µm / 35mils
Hempadur Quattro Fibre 47604	2000µm / 80mils	1300µm / 52mils

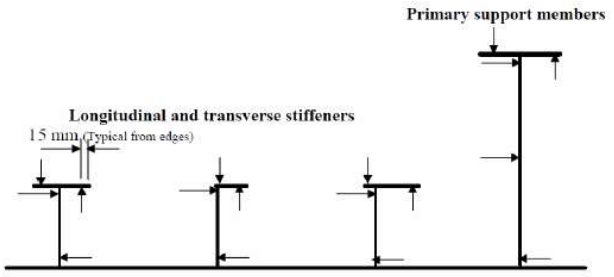
Time to Ballast (Days)

Product	-10°C/14°F	0°C/32°F	10°C/50°F	15°C/59°F	20°C/68°F	30°C/86°F
Hempadur 15600	-	12	6	3	1.5	-
Hempadur 17630/17633	-	20	10	-	5	2.5
Hempadur Quattro 17634	40	20	10	-	5	2.5
Hempadur Quattro XO 17720	40	20	10	-	5	2.5
Hempadur Quattro XO 17820	40	20	10	-	5	2.5
Hempadur Quattro XO 17870	40	20	10	-	5	2.5
Hempadur Quattro XO 1787K	40	20	10	-	5	2.5
Hempadur Quattro Fibre 47604	40	20	10	-	5	2.5

Inspection

Conducted by qualified and certified coating inspector(s): 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 90% of 320µm.
- Non-destructive testing desired.
- 1 reading per 5m^2 on a flat surface.
- 1 set of readings per 2-3m along longitudinal, transverse member and primary support members.
- 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

There are 3 different methodologies specified in IACS UI SC233 for the coating manufacturer to apply for approval of its coating system.

Existing Epoxy Coating Systems

- 5 year field test, existing epoxy coating systems may be applied to provide protection against corrosion, provided they have documented field exposure for at least five years with a final coating condition of not less than ´GOOD´.
- Marintek B1 approvals, epoxy coating systems with satisfactory Marintek B1 test reported to 8th Dec 2006 may be applied to provide protection against corrosion.

New Epoxy Coating Systems

- New epoxy coating systems may be applied to provide protection against corrosion, provided they have been tested and documented in accordance with the procedures detailed in IMO PSPC-SWBT Annex 1.
- Successful testing will result in a Type Approval Certificate issued by the relevant classification society.

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.