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- 1. IMO/PSPC, current status
- 2. Needs for standards/Codes
- 3. Comments on KSPIP
- 4. Needs ISO
- 5. Conclusion/Proposal

1. IMO/PSPC, current status

PSPC for WBT

Mandatory

All type of ships

WBT & double side skin space of Bulk carriers

Entry into force from July 1, 2008

PSPC for Voids

Non-Mandatory

Bulk carriers & Tankers

Void spaces

Entry into force from Oct. 5, 2007

PSPC for COT

Mandatory

Crude Oil Tankers

Cargo Oil Tanks

Entry into force from Jan. 1, 2013

Definition of Crude oil tanker

Res.MSC.288(87); 2.1 Crude oil tanker is as defined in Annex I of MARPOL 73/78.

- Crude oil tanker means an oil tanker engaged in the trade of carrying crude oil.
- Product carrier means an oil tanker engaged in the trade of carrying oil other than crude oil.

Definition of Crude oil tanker

Res.MSC.291(87) – amendment to SOLAS CHAPTER II-1, 3-11; Crude oil tanker: Refer to items 1.11.1 or 1.11.4 of the Supplement to the International Oil Pollution Prevention Certificate (Form B).

- 1.11.1 Crude oil tanker
- 1.11.4 Crude oil/product carrier

•PSPC/WBT: Res.MSC.215(82)

Item	IMO PSPC	Remark
Entry into force	2008. 7. 1.(contract base)	
NDFT	2 spray coats, Epoxy 320 mic. (90/10 Rule)	
Dust	-Rating "1" for size class "3", "4", "5" -Invisible with naked eyes for size class "1", "2"	
Salts	$\leq 50 \text{ mg/m}^2$	
String aget	2 stripe coats, 1 stripe coat can be dispensed on welds subject to meet NDFT	All welds &
Stripe coat	Stripe coat shall be applied by brush or roller. Roller to be used for scallops, rat holes, etc. only.	Edges
Edge	2R, 3 pass grinding or equivalent	
DFT	shall be measured in accordance with Annex 3	
Steel condition	ISO 8501-3 P2	
Profile	30 ~ 75 mic. in case of blasting	

Item	IMO PSPC	Remark
Surface preparation before erection	-Shop Primer damage area : Sa 2.5 -Contamination : Sweeping or H.P washing or equivalent	
Surface preparation after erection	-Butt : St 3 or better -Damage up to <mark>2</mark> % /tank : St 3 -Contiguous damage up to <mark>25</mark> m² : St 3	
Coating Technical File	-prepared by the shipyard -on boarded and maintained	
Qualification of inspector	NACE Level 2, FROSIO Level III or equivalent	
TAC	-All epoxy system shall be type approved -Cross over test with shop primer shall be performed	
Procedure & Inspection	-Three parties agreement -Certified inspector agreed by three parties -CTF shall be verified by the Administration	

•PSPC/Voids: Res.MSC.244(83)

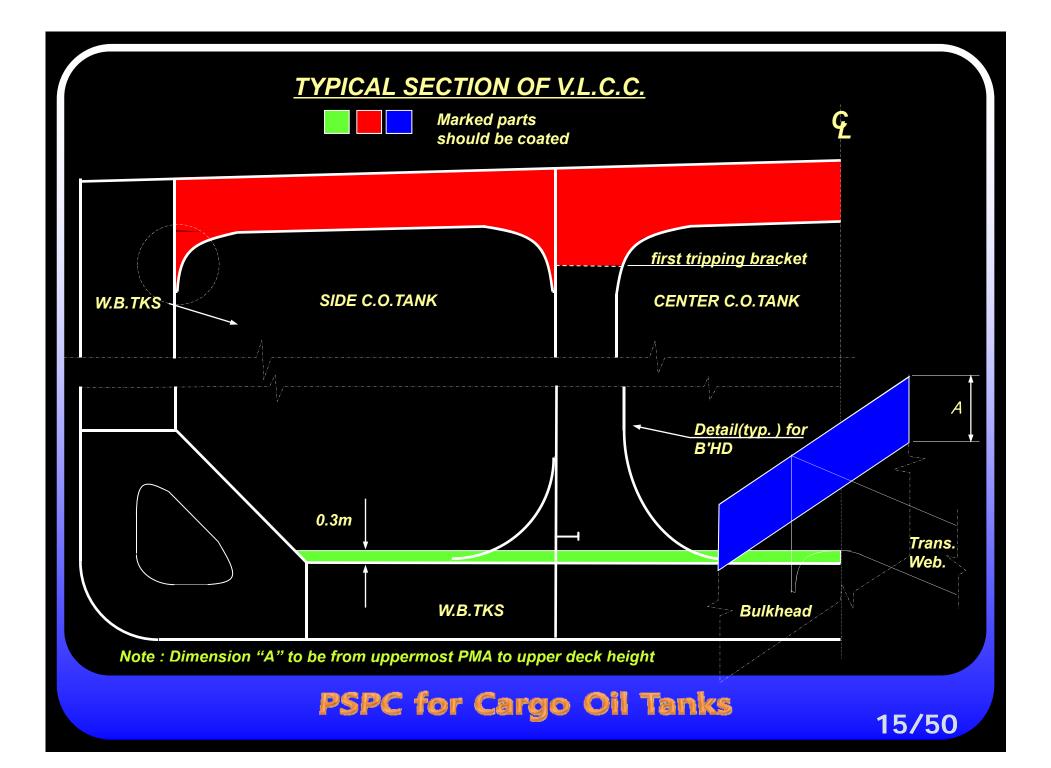
Item	IMO PSPC	Remark			
Entry into force 2007. 10. 5.(contract base)					
NDFT	1 spray coat, Epoxy 200 mic. (90/10 Rule)				
Dust	-Rating "2" for size class "3", "4", "5"				
Salts	\leq 50 mg/m ² for PSP & \leq 100 mg/m ² for SSP				
Ctuin a cont	1 stripe coat on thermally cut free edges only				
Stripe coat	Stripe coat shall be applied by brush or roller. Roller to be used for scallops, rat holes, etc. only.				
Edge	1 pass grinding or equivalent				
DFT	shall be measured in accordance with Annex 3				
Steel condition	ISO 8501-3 P1				
Profile	30 ~ 75 mic. in case of blasting				

Item	IMO PSPC	Remark
Surface preparation before erection	-Shop Primer damage area : Sa 2 or St 3 -Contamination : Sweeping or H.P washing or equivalent	
Surface preparation after erection	Butt : St 3 or better	
Coating Technical File	-prepared by the shipyard -on boarded and maintained	
Qualification of inspector	NACE Level 2, FROSIO Level III or equivalent	
TAC	-All epoxy system shall be type approved -Cross over test with shop primer shall be performed	
Procedure & Inspection	-Three parties agreement -Certified inspector agreed by three parties -CTF shall be verified by the Administration	

•PSPC/COT: Res.MSC.288(87)

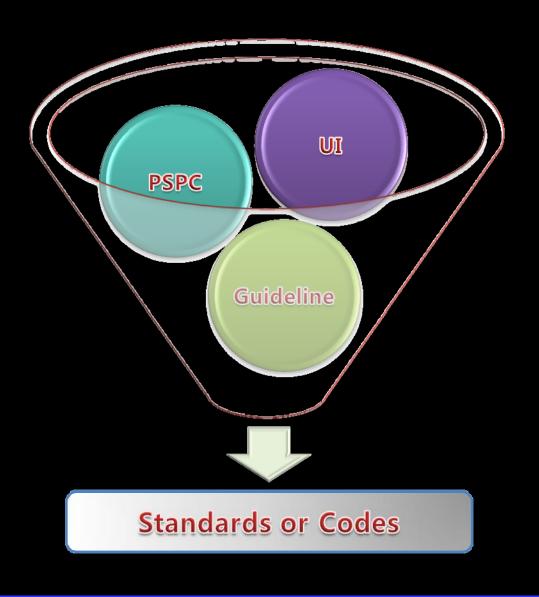
<i>Item</i>	IMO PSPC	Remark
Entry into force		
NDFT	2 spray coats, Epoxy 320 mic. (90/10 Rule)	
Dust	- Rating "1" for size class "3", "4", "5" - Invisible with naked eyes for size class "1", "2"	
Salts	$\leq 50 \text{ mg/m}^2$	
Ctring agat	2 stripe coats, 1 stripe coat can be dispensed on welds subject to meet NDFT	All welds &
Stripe coat	Stripe coat shall be applied by brush or roller. Roller to be used for scallops, rat holes, etc. only.	Edges
Edge	2R, 3 pass grinding or equivalent	
DFT	shall be measured in accordance with Annex 3	
Steel condition	ISO 8501-3 P2	
Profile	30 ~ 75 mic. in case of blasting	

Item	IMO PSPC	Remark
	-Shop Primer damage area : Sa 2.5 -Contamination : Sweeping or H.P washing or equivalent	
Surface preparation after erection	-Butt: St 3 or better -Damage up to 3 % /tank for Deckhead: St 3 -Damage up to 20 % /tank for Bottom: St 3 -Contiguous damage up to 25 m ² : St 3	
	-prepared by the shipyard -on boarded and maintained	
Qualification of inspector	NACE Level 2, FROSIO Level III or equivalent	
TAC	-All epoxy system shall be type approved -Cross over test with shop primer shall be performed	
Procedure & Inspection	-Three parties agreement -Certified inspector agreed by three parties -CTF shall be verified by the Administration	

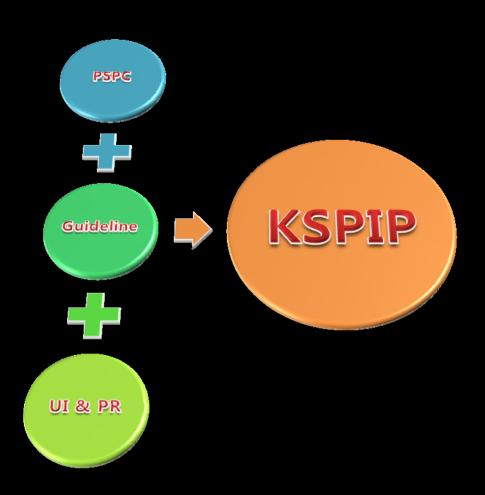


Item	PSPC/WBT	PSPC/COT	PSPC/VOID		
Method of application	Mandatory		Non-mandatory		
Type of ships	All type of ships	Crude oil tanker	B/C & Tanker		
Area to be protected	All area	Top & Bottom	All area		
NDFT	2 coats, 320μm 1		1 coat, 200μm		
Dust for size "3", "4", "5"	"	1"	"2"		
Allowable salt level	50 mg/m²		100 mg/m²		
Stripe coat	2 coats on all	edges & welds	1 coat on cut edge		
Edge treatment	2R, 3 pass 1 p		1 pass		
Steel condition	P2		P2		P1
SSP at block	Sa 2 ¹ / ₂		Sa 2 or St 3		
St 3 for after erection	Damage < 2 %	Damage < 3 % or 20%	-		

2. Need for Standards/Codes



need for standards/codes



KSPIP

KSPIP, for general part

KSPIP for PSPC/WBT, for water ballast tanks

KSPIP for PSPC, for water ballast tanks & COT

The Korean Shipbuilders' Painting & Inspection Practice



The Korean Shipbuilders'
Painting and Inspection Practice
for IMO PSPC
(KSPIP for PSPC/WBT & PSPC/COT)
2010



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The Korea Shipbuilders' Association

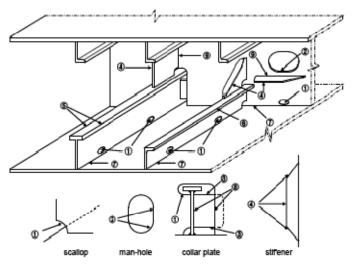




Chapter 2 Ceating work PART 2

Section 2 Coating work

2.3 Stripe coats shall be applied in accordance with Figure 3.



ltem	Detail Item	Treatment	Part to be applied		No. in sketch	Execution	Remarks		
			Hole Small	Small hole	0				
			edge	Large hole	3				
	Flame-cut edge	By grinding	Free	Collar plate	3	after 1st coat			
Edge			edge	Stiffener	®	and 2nd (or final) coat			
		By rolling machine	T-bar Longitudinal (Built-up section)		6				
	Rolled edge	By rolling machine		Longitudinal, flat bar	6				
	Automatic welding	By welding machine/equipment	Joint of Longitudinal and plate		9				
Welding beads	Wanual	Manually	where imprac obtain	f collar plate it is ficable to sufficient y spraying)	*	after 1st coat or 2nd (or final) coat	••		
	welding		Joint of stitlener where it is impracticable to obtain sufficient DFT by spraying)		where it is impracticable to obtain sufficient				•

Remark Mark "●": Unless NDFT is proven, two stripe coat shall be applied.

Figure 3 Detail of stripe coating for each part

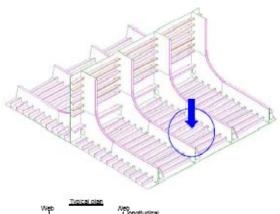


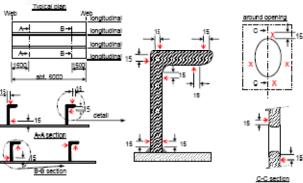


Chapter 3 DFT measurements PART 3

Dimensions in mm

Section 4 Example of DFT measurements





Part	Detail	Criteria	Area/Length (example)	Number of measurement (example)	Remark (example)
Flat curface	Deck head piste	1 point/6 m²	xxx m*	XXX	8 points/section
Primary Support member	Web frame	3 points/ 2-3 m interval	xxx m	xxx	3 sets between primary support members
Support member	Longitudinal, St r fener	2 points/ 2−3 m interval	Xxx m	xxx	2 sets between primary support members
Opening	around opening	2 points/ opening	xx ea	xx	
Tank boundary		1 point/ 2-3 m interval	xx m	xx	
Total				XXX	
Welding joint	refer to flat surface	1 point/6 m²	xxx m²	XXX	to dispense the (second) stripe ocat

Figure 6 Example of DFT measurement for cargo oil tank block of VLCC





Annex F	PART 4
Example of Inspection report	

도장 일지							
(Coating Log)							
						일련번호(Sheet	No.): CL-
선번 혹은							
(Project number 구조명(Part of							
(Block name/Ta							
조선소							
(Name of s		d)					
작업:	-			□ 블록단계 / [
(Construction	on stag	ge)	l .	(Block assen	ibly / Pre-erecti	on / Erection)	
총간도장(Intermediate	ooatir	ng)					
				일	기조건(Environ	mental conditio	in)
순서		도료명	일자(시간)	건구온도	상대습도	이슬점	철판온도
(Sequence)	(F	Paint name)	(Date(time))	(Dry bulb	(Relative	(Dew point)	(Surface
1회 도장				temperature)	humidity)		temperature)
1의 도망 (1st Coat)				°c	%	°c	°c
2회 도장							
(2nd Coat)				°C	%	°C	°C
건도막두께 측정(Dry file	m thic	kness measu	rement)				
규정 건도막두께				최대 건도막두께 (Max. D.F.T.) 최소 건도막두께		μm	
(Specified D.F.T.)		320	μm				
(opecined 5.1.1.)					D.F.T.)	ų.	m
		속진	ii수	,,,,,,,,,			
		(Number	of points)				
		평균 건.	도막두제		u	m	
측정 건도막두께			e D.F.T.)				
(Measured D.F.T.)			건도막두제 n. D.F.T.)		μm	/ µm	
		90 /10	0 규정		(Pass)	☐ 불합격(Fall)	
24 (12) 10			합격(Pass)	•		☐ 불합격(Fall)
비교(Remarks):							
검사(Checked by);							
THE TRANSPORT		Hed		dial		Hed	
(Coating Inspector)		성명(Name):		확인(Verified)	by);	성명(Name):	
□ 보조검사원				도장검사원			
(Assistant to coating	1	서명(Signatur	re):	(Coating Insp	ector)	서명(Signatur	e):
Inspector) □ 라인 품질요원							





3. Comments on KSPIP

Item	Class Comments	Reply/Solution	Remarks	
CTF part 1	Tripartite agreement to be made prior to W/C	Noted	IACS UI SC 223	
CTF	Example CTF(DNV) to be used	Not to be used	DNV only	
Shipyard audit	Audit for shipyard's facility	Discussed	DNV only	
Curing test for shop primer	Curing test to be performed	Not applicable	DNV only	
Monitoring of PSP	Monitoring of PSP	Once per month		
Use of other references	JSRA/JSTRA-SPSS not to be used	Should be used	Only ISO to be applied (LR)	

Item	Class Comments	Reply/Solution	Remarks
Dust check on PSP	Dust check to be performed on PSP	Not applicable	NK only
Stripe coating tool	Roller not to be used	Noted	IACS UI SC 223
Dispute between inspectors	Procedure to be specified	Maker's opinion to be followed	
Number of inspectors	Multiple inspector to be specified	Decided by the Inspector	Monitoring by the owner's inspector
Assistant to inspector	No paint maker's inspector to be specified	Decided by the Inspector	
Stripe coat on welds	2 nd stripe coat only to be dispensed	Decided by the Builder/inspector	

Item	Class Comments	Reply/Solution	Remarks
Salt measurement	1 per block/section/unit	1 per block	
Block final inspection	To be performed within the recoating interval	Decided by the Builder	
Edge grinding	3 pass grinding with 2mm radius	3 pass grinding to be applied without mentioning radius	
Intact shop primer	To be sweep blasted or high pressure washed	No treatment, cleaning only to be applied	LR only required to sweep blast or high pressure washing on intact shop primer
DSS on topside tank in B/C	PSPC to be applied	PSPC not to be applied	* See figure

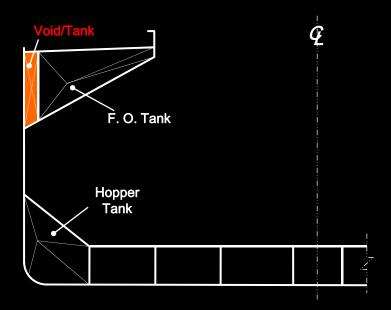


Fig. 1 Single side skin construction (PSPC not to be applied)

Definition of DSS

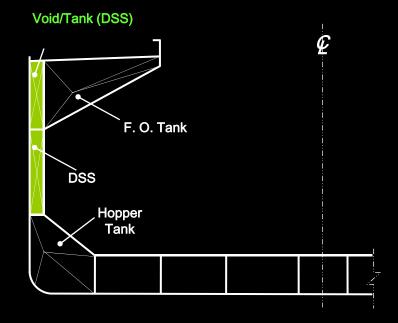


Fig. 2 Double side skin construction (PSPC to be applied)

Effective date: Jul. 1, 2011(contract)

W SC 223 rev.2 g

1.3.5 For the coating pre-qualification test, the measured average dry film thickness (DFT) on each prepared test panels shall not exceed a nominal DFT (NDFT) of 320 microns plus 20% unless a paint manufacturer specifies a NDFT greater than 320 microns. In the latter case, the average DFT shall not exceed the specified NDFT plus 20% and the coating system shall be certified to the specified NDFT if the system passes the tests according to Annex 1 of MSC 215(82). The measured DFT shall meet the "90/10" rule and the maximum DFT shall be below the maximum DFT value specified by the manufacturer

W SC 223 rev.2 g

PSPC 8 ALTERNATIVE SYSTEMS

Interpretation

The definition of alternative systems

- 1. Normal coating systems, i.e. not alternative systems is ;
 - epoxy-based system applied according to table 1 of PSPC
- 2. Alternative systems can be coating systems which are;
 - epoxy-based systems, <u>but not applied according to table 1 of</u>
 PSPC
 - non epoxy-based systems applied according to table 1 of PSPC or
 - non epoxy-based systems, <u>but not applied according to table 1</u> of <u>PSPC</u>.

W SC 223 rev.2 g

PSPC 8 ALTERNATIVE SYSTEMS

The requirement of coating system approval for alternative systems

1. Type Approval Certificate shall be issued subject to satisfaction of the test procedure given in annex 1 to this standard, evaluated according to the acceptance criteria for alternative systems.

W SC 223 rev.2 g

PSPC 8 ALTERNATIVE SYSTEMS

The application of alternative systems

- 1. The necessary conditions for application, especially for difference from conventional epoxy coating system should be specified in the coating technical file as per section 3.4. of MSC.215 (82).
- 2. It is recommended that the work for confirmation of the suitability of application (workability, coating quality, worker's skill and so on) is demonstrated before the project starts

Item	Owner Comments	Reply/Solution	Remarks
Inspection	Owner's inspection to be performed	Inspection to be performed by agreed coating inspector	Monitoring by owner's inspector (certificate required)
DFT check between coats	DFT check on each coat	Representative DFT check only for QA purpose	Annex 3 not to be applied and no record on CTF
CTF	Inspection report to be submitted for review	Inspection report to be reviewed by Class	Copy of result can be submitted for reference only
Stripe coat	Roller can be used on edges & weld	No roller to be used for edges and weld	Roller to be used on small holes only
Edge grinding	3 pass grinding not to be applied	According to PSPC requirement	Decided by the builder

4. Needs ISO





- · New work item proposal Sep. 01, 2009
- · PSPC for WBT, Voids, COT

Approval

- · NP presentation at ISO TC8 meeting
- · NP approved Jan. 04, 2010

WG

- · 1st Working Group meeting Feb. 02, 2010
- · 2nd Working Group meeting Oct. 18, 2010

ISO CD for PSPC (Protective Coatings and Inspection methods)

Part 1-WBT Part 2-Voids Part 3-COT Part 4 - Salt measurement

Draft ISO CD incorporates

- -IMO documents (resolutions, guidelines),
- -IACS UI SC 223 & PR 34,
- -Industry standards (KSPIP,JSRA/JSTRA-SPSS)
- -Reasonable comments from Class & Owner, etc.



ISO CD for PSPC

Ships and marine technology — Protective coatings and inspection methods — Part 1: Dedicated sea water ballast tanks

1 Scope

This part of ISO 16145 specifies a method of protective coatings and its inspection of dedicated seawater ballast tanks for all types of ships of not less than 500 gross tonnage and double-side skin spaces of bulk carriers of 150 m in length and upwards, which are contracted for new building on or after July 1, 2008.

This document also applies to the dedicated seawater ballast tanks of oil tankers of double hull construction of 150 m in length and upwards and double-side skin spaces of bulk carriers of 90 m in length and upwards, which are contracted for new building on or after December 8, 2006.

2 Normative references

The following referenced documents are no spensable for the application of this document. For dated references, only the edition of the referenced document (including any anti-durinents) applies.

ISO 8501-1:1968, Preparation of steel substrates perore application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of sieel substrates after overall removal of previous coatings

ISO 8501-1:1958 Topp 1694) Representative photographic examples of the drampe of appearance imparted to steel when bight the left with different property is story to be lead in July Tribin with 150 6501-1.1965 while it is an intermedial supplement to 150 8501-1.1966

ISO 8501-3:2001, Preparation of steel substrates perfore application of paints and related products — Visual assessment of surface cleanliness — Fact 3: Preparation grades of welds, cut edges and other areas with surface imperfections

IBO 8602 3:1002, Preparation of steel substrated before abplication of paints and related products. Tests for the assessment of surface cleanliness. Part 3 Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method).

ISO 8502-6:1995, Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 6: Extraction of soluble contaminants for analysis — The Bresle method

ISO 8502-9:1998, Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 9: Field method for the conductometric determination of water-souble salts

ISO 8503-1:1988, Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces

ISO 8503-2:1988, Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 2: Method for the grading of surface profile of abrasive blast sleaned steel — Comparator procedure

Ships and marine technology — Protective coatings and inspection methods — Part 2: Void spaces

1 Scope

This part of ISO 16145 specifies a method of protective coatings and its inspection of void spaces of bulk carriers and oil tankers, which are contracted and agreed to apply PSPC/VOID [IMO Res.MSC.244(83)] for new building on or after October 5, 2007.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8501-1:1988, Pregaration of steel substrates before application of paints and related products — Visual assessment of surface obsanifies — Pair 1/ File giples and preparation brades of uncoated steel substrates and of steel outstrates after over all lemptons of previous calculus.

ISO 8501-1:1988/Suppl:1994, Representative photographic examples of the change of appearance imparted to steel when blast-cleaned with different abrasives (it should be read in conjunction with ISO 8501-1:1988 while it is an informative supplement of ISO 8501-1:1988.)

ISO 8501-3:2001 Preparetion of steel substrates before application of yaints and related graducts — Visual assessment of suitable cleanliness — Parks. Preparation graphes of wests, at edges and other areas with surface imperfections.

ISO 8502-3:1992, Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanity and steel surfaces prepared for painting (pressure-sensitive tape metropi)

ISO 8502-6:1995, Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanthess — Part 6: Extraction of poliuble contaminants for analysis — The Bresle method

ISO 8502-9:1998, Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 9: Field method for the conductometric determination of water-soluble saits

ISO 8503-1:1983, Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of biast-cleaned steel substrates — Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive biast-cleaned surfaces

ISO 8503-2:1983, Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 2. Method for the grading of surface profile of abiasive blast-cleaned steel — Comparator procedure

ISO 11127-6, Preparation of steel substrates before application of pain's and related products —Test methods for non-metallic blast-cleaning abrasives — Part 6: Determination of water-soluble contaminants by conductivity measurement COMMITTEE DRAFT ISO/CD 16145-3

Ships and marine technology — Protective coatings and inspection methods — Part 3: Cargo oil tanks

1 Scope

This part of ISO 16145 specifies a method of protective coatings and its inspection of cargo oil tanks for crude oil tankers of not less than 5 000 tonnes deadweight, which are contracted for new building or or after January 1, 2013.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8501-1:1988. Preparation of steel substrates before application of paints and related products — Visual assessment of sulface occalinese Pert 1: Aust grades and preparation grades of unsocied steel substrates and of steel substrates after overall removal of previous coalings.

ISO 8501-1:1983/Suppl 1944. Representative protographic strainbles of the change of acpearance imparted to steel when bisst-cleaned with different abrasives (it should be read in conjunction with ISO 8501-1:1988 while t is an informative supplement to ISO 8501-1:1988.)

ISO 8501-3:200/. Preparation of steel supetrates before application of paints and related products — Visual assessment of surface clear wheels — Pari 3: Preparation grades by welds, cut eliges and other areas with surface impertentions.

ISO 8502-3:1992, Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 3: Assessment of dust on steel surfaces prepared for painting (pressure sensitive tape method)

ISO 8502-6:1995, Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanings. — The Bresie method

ISO 8502-9:1998. Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleaniness — Part 9: Field method for the conductometric determination of water-soluble saits

ISO 6503-1:1968, Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces

ISO 8503-2:1988, Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 2: Method for the grading of surface profile of abrasive blast-cleaned steel — Comparator procedure

ISO 11127-6, Pieparation of steel substrates before application of paints and related products — Test methods for non-metallic blast-cleaning abrasives — Part 6: Determination of water-soluble contaminants by conductivity measurement

IMO Fes.MSC.238 (87), Performance standard for protective coatings for cargo oil tanks of crude oil lankers

CD

- · Circulate draft CD Nov. 2009
- · Submit CD to ISO TC8/SC8 Secretary Dec. 2010
- · 3rd WG meeting Feb. 2011

DIS

· Register DIS - Jul. 2011

FDIS

· Register FDIS - Jul. 2011

IS

· Publishing IS - Jan. 2013

NP for salt measurement

ISO 8502-9

- Bresle method
- Need consumable
- < 5 min

NP

- Cartridge type
- No consumable
- < 1 min

Future plan to ISO

MP for secondary surface preparation

Expect NP for secondary surface preparation

- → No ISO standards for shop primed surface
- → Existing JSTRA-SPSS to be utilized

5. Conclusion/Proposal

- ✓ Unified understanding on PSPC is important.....
- ✓ Uniform application of PSPC is more important.....
- ✓ Shipyard should lead PSPC related inspection.....
- ✓ New industrial standards should be established.....

Thank you for attention

presented by Seo sang-soo Hyundai Heavy Ind. Co., Ltd. c3e2@hhi.co.kr