Ministry of Defence

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WARPAINT

Issue 40
September 2016

Defence Equipment & Support

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The information on acceptable paint systems / coatings, given in this publication, updates BR3939 Issue 3 - October 2014.

1. INTRODUCTION

1.1 WARPAINT is the main guidance document of acceptable paint coatings for in-service and new-build Royal Naval Vessels. However, not all approved coatings are necessarily listed in WARPAINT as paint manufacturers' are constantly striving to improve their current paint systems. Consequently the Whole Ship Specifications (WSS) / Annexes are regularly updated. Should a coating therefore be proposed, which is not listed in the current issue of WARPAINT, confirmation of acceptance must be obtained.

1.2 **NOTE:** All paint coatings listed in the annexes are to be applied strictly in accordance with their respective paint manufacturers' Technical (TDS), Material Safety Data Sheets (MSDS) and Instructions. This includes all aspects of the preparation stage and post application. TDS's are used to define a Paint Specification that must be followed *in conjunction with* the data sheets. Full Quality Control (QC) data must be recorded to provide assurance and evidence that the specification has been satisfactorily achieved.

1.3 The differing paint manufacturers 'Whole Ship Specification' annexes are listed in alphabetical order and it is important to first determine your current paint supplier before ordering *any* specific coating. For example; there have been instances where coatings manufactured by Chugoku Paints (UK) Ltd have been ordered, simply because they are listed first (alphabetically) in the annexes.

1.4 WARPAINT is only available electronically. The easiest way to obtain an e-copy is via the internet or intranet. From here it can be easily downloaded. Information on accessing these websites is detailed at 1.6 and 1.7.

1.5 The main aim of WARPAINT is to continue to offer guidance on the various approved commercial off the shelf (COTS) paint manufacturers' coatings that have been assessed for their health and safety, fire and toxicity and suitability when applied to various areas of Royal Naval Vessels. This issue should be a useful addition to the data required by projects for ship/submarine build or maintenance.

1.6 The latest copy of WARPAINT is available via the DE&S *intranet* website at: http://defenceintranet.diif.r.mil.uk/Organisations/Orgs/DES/Organisations/Orgs/CoMFleet/Ships/Pages/WARPAINT.aspx or on the World Wide Web at: https://www.gov.uk/government/publications/warpaint

1.7 WARPAINT and extracts relative to areas of ship husbandry can also be found on the 'Ship / Submarine Husbandry & Habitability Information Portal' via the internet at: www.ShipShapeRN.com along with a full copy and current issue of BR3939. To gain access to this database you will require a user name and log in available by emailing your request and details to DESShipsWSpt-PEG-Husbandry@mod.uk

2. AMENDMENTS TO ISSUE 39 & PERTINENT ITEMS, inc. FROM PREVIOUS ISSUES

2.1 Front Cover: HMS SUTHERLAND at sea on exercise. This Frigate is now 20 years old and the T23 Class have many challenges to maintain the material state and remain ready for operational duty, especially crucial with the recent life-extension requirements. The full blast back-to-bare to renew the anti-corrosive primer and a modern top coat for the above water hull and superstructure will definitely assist in this endevour.

2.2 ICCP systems can have a detrimental affect on Foul Release coatings. In the ship is alongside with low tidal flow the anodes slowly release chlorine free radicals which will eventually attack and strip the coating around and predominently above the anode. Ships are asked to bare this in mind and regulate the ICCP system where possible.

2.3 A propeller and shaft FRC painting trial on-board HMS Northumberland has concluded. Although there were many issues with the trial there was enough info to base an engineering decision on – which was to apply FRC on the prop & shafts to the Class. There is no real financial gain, breaking even with in-water cleaning, but there is the advantage of reducing any cleaning effort when in dock and removing the potential for environmental restrictions conflicts where UW cleaning is required in foreign ports. It is critical that the ICCP system is balanced correctly and that the earthing arrangments are maintained or it could result in dezincification of the props.

2.4 The use of brush and roller to apply professional 'marine grade' paint should be limited to small repair areas. Roller application is particularly poor.

Roller application has following dis-advantages:

- Uneven coat thickness.
- Thinnest type of application that requires 3-4 coats to build up to 50 micrometres thickness (DFT) – product dependant - application using a brush is better.
- Rough finish with roller particles etc left in the paint film - not aesthetically pleasing and more difficult to clean in-service.
- Edge DFT poor due to extra pressure on corner application

NOTE: There are now modern cordless sprayers that can apply required WFT in one application.

Use of rollers and brush for large scale application is not in accordance with BR3939 – Section 2 Policy, Para 0206 – **'All paint application is to be by the manufacturer's recommended method'**. Deviation requires robust justification and agreement from the PDH. Mitigation to compensate for the sub-standard appication should also be agreed upon i.e. increased QC to ensure DFT achieved.

NOTE: All respective companies are to undertake regular reviews, proposing the latest products for inclusion and submitting corrections where required. This includes WSS, Submarine specification and all NSN's, which, if up-to-date on ISIS & CRISP, helps the contract of supply and stores system. A full ISIS list containing historic and current codified items can be supplied on request.

2.5 WET ABRASIVE BLASTING

2.5.1 As a consequence of environmental legislation, the use of dry abrasive blasting is restricted, especially with regard to coating(s) removal from ships hulls, hence the necessity of employing "Wet Blasting" methods. As regards surface preparation, Defence Standards indicate that abrasive blasting is to be in accordance with BS 7079 Part A1 Sa 2½. In the Introduction to this particular Standard, reference is made to several International Standards and the readers attention is specifically drawn to ISO 8504 (BS 7079 Part D2: 1993) Methods for surface preparation. This standard describes the methods of abrasive blast cleaning. The general term "Wet Blasting" can mean one of four distinct methods namely:

2.5.1.1 **Moisture-injection abrasive blast cleaning** (compressed air moisture injection abrasive blast cleaning). -This method is similar to compressed air abrasive blasting but with the addition of a small amount of liquid (usually clean fresh water) to the abrasive stream before the nozzle, resulting in a dust free procedure.

2.5.1.2 **Compressed air wet abrasive blast cleaning. -** This method is similar to compressed air abrasive blasting but with the addition of liquid (generally clean fresh water) before or after the nozzle to produce a stream comprising air, water and abrasive.

2.5.1.3 **Slurry Blasting -** A dispersion of fine abrasive in water or other liquid is directed with or without compressed air onto the surface to be cleaned.

2.5.1.4 **Pressurised liquid blast cleaning -** An abrasive (abrasive mixture) is introduced into a steam of liquid (generally clean fresh water) and the wet abrasive stream directed through a nozzle at the surface. This method is predominantly pressurised liquid and the additions of solid abrasive are normally less than for compressed air wet abrasive blasting. The abrasive may be introduced either dry (with or without air) or as a wet slurry.

2.5.2 The 4 methods listed above leave the surface wet or at least damp and apart from Slurry Blasting, Sa 3 grade can be achieved on all three rust grades described in BS 7079 Part A1. The Standard acknowledges that flash rusting occurs and indicates that suitable inhibitors may be used. It is not MOD policy to encourage the use of inhibitors, and flash rusting is normally accepted by the paint manufacturers, each of whom has their own definition of acceptability. As a general rule of thumb however, flash rusting when viewed head on will not normally be obvious to the naked eye, but will when viewed at an angle of 30º to the surface, exhibit a "gingered" look.

2.6 UNDERWATER CLEANING

2.6.1 Questions regarding the scrubbing of underwater hulls, revealed a lack of understanding of fouling mechanisms. It should be noted that Self Polishing and Foul Release anti-fouling coatings are both inherently soft and that the coatings are easily damaged/removed by inexperienced and unskilled operatives using the wrong techniques.

2.6.2 Depending on the season and geographical location, cleaning can release millions of spores which will immediately re-settle on the cleaned hull surface and can actually result in denser fouling than before. Should it be decided that underwater cleaning is required, it should be performed as late as possible before the ship sails to reduce the likelihood of spores attaching themselves to the ship. It is also important to consider all other hulls in the vacinity which could be affected.

2.6.3 An Underwater Engineering Services Contract is managed by the Salvage & Marine Operations Team and seeks to provide In Water Maintenance and Repair support for RN, RFA and Submarines. Support services include the provision of hull cleaning and propeller polishing, but **the removal of marine fouling in port is often limited by environmental restrictions which must be adhered to**. Solutions to this issue, in the form of closed cycle hull cleaning equipment, to recover and filter removed fouling, is now starting to become available in some locations.

2.6.4 Widespread use of Foul Release coatings have resulted in a significant drop in demand for hull cleaning but detrimental levels of fouling can build up particularly in warmer ambient conditions and following extended periods alongside. Full power runs in accordance with the latest RNTM, as a minimum, will often resolve the issue but occasionally fouling will become so severe that hull cleaning is the only solution.

2.6.5 If a hull clean is required Authorities are encouraged to utilise the Underwater Engineering Services contract for provision of accredited diving contractors who, not only will have been assessed on their ability to undertake hull cleaning whilst protecting the integrity of the Foul Release coating, but will also conduct the task in accordance with the HSE Diving at Work Regulations 1997, a requirement detailed in JSP 375, Leaflet 29. Alternative cleaning solutions offered in port can have a detrimental effect on the integrity of the hull coating.

2.6.6 For provision of Underwater Engineering Support or advice, the Salvage & Marine Operations Underwater Engineering Desk can be contacted at the e-mail address below: -

E-mail: DESSANMO-UWESO1-SPEC@MOD.UK
Tel - Mil: 9679 83350 Civ: 030 679 83350

2.7 PREPARATION OF FRP SURFACES

2.7.1 It would appear there is some misinterpretation of the instructions for the surface preparation of Fibre Reinforced Plastic (FRP) surfaces. Failure to observe the requirements can lead to catastrophic results. BR3939 Section 4 and WARPAINT Issue 39 stipulates the requirements for pressure washing and abrasive blasting.

2.7.2 Recent emergent work on HMS PEMBROKE highlighted the requirement for further guidance / standards on this topic. BR3939 to be updated in due course. Please get in touch should further guidance be required in the interim as LFE details were captured.

3. VOC COMPLIANT COATING SYSTEMS

3.1 EU Legislation changed the way VOC emissions are recorded. Notwithstanding this, there remains a MOD requirement for low VOC materials. Based on the guidance table below, Paint Manufacturers and Suppliers are reminded that any formulation changes to their existing products ***must*** be advised. They will then be required to provide the Institute of Naval Medicine (INM) with full product formulation data, on request. Failure to do so will automatically result in the withdrawal of MOD(N) acceptance. INM forms can be provided on request and any submissions must go through DES Ships WSpt-PEG-Husbandry.

3.2 MOD(N) requires that Paint Manufacturers and Suppliers quote VOC levels in accordance with CEN or ISO Standards.

3.3 The MOD(N) maximum VOC target levels are shown in the following table and both paint manufacturers and applicators are encouraged to propose/apply coatings which at least meet or are lower than these target levels.

Category No.	Category	VOC limit - gms/litre, Paint less Water
(i)	Blast/Weldable primer *	600
(ii)	Tie-coats/sealers	550
(iii)	General primer/undercoat	200
(iv)	External Finishes	420
(v)	Internal Finishes	200
(vi)	Anti-Fouling #	400
(vii)	AFFF Tanks	390
(viii)	Demineralised Water Tanks	390
(ix)	AVCAT, Dieso & Hydraulic Oil Tanks	390
(x)	All other tank coating systems inc. cofferdams, engine room bilges & chain lockers	300
(xi)	Marine Varnish	530

* Blast or holding primers are typically applied to a specified thickness of 25 - 40 micrometres and are not considered to be weldable. Shop primers, or weldable primers, are applied by automatic spray, typically to a dft of 15 - 25 micrometres. It is recommended that the primer is removed before welding unless the user can demonstrate that the presence of the material does not affect weld integrity. This is particularly important where high strength steels, such as QN1, QN2, HY80 etc, with susceptibility to hydrogen cracking, are used. In all cases, the end user must establish whether the condition of supply of the coated steel substrate is suitable for their specific welding process conditions.

\# The balance between VOC level and toxic content (should there be any) will be assessed. It may prove necessary to accept a higher VOC material if the lower toxic content outweighs the release of VOC.

3.4 For the benefit of New-Building Specifications ONLY, if a paint system can offer cost benefits but one part of it has a VOC level higher than the MOD(N) target value, the actual VOC value must be equal to or less than the stated value in Process Guidance Note 6/23 which can be found here: www.defra.gov.uk. This part of the scheme could be proposed on the assumption that it will be subsequently submitted for approval and inclusion in WARPAINT. In this instance data will be required supporting the case, including a statement that the total VOCs' to be given off to the atmosphere during application, will be equal to or less than when applying a paint scheme fully in accordance with the MOD(N) target values.

4. SUBMARINE SPECIFICATIONS

4.1 Acceptable paint specifications are outlined in Annex J, together with a list of other acceptable materials.

4.2 DESSMPG-NavArch3bNNPPI@mod.uk, Tel. No. 030 679 33221, is the Structures & Coatings POC within In-Service Submarines.

4.3 BR1326 Classification can be found in the 'Submarine Material Toxicity Database' located here - http://www.tes-ssg-smtd.r.mil.uk/. DES NAG SMAtm1 is the sponsor of the hazard assessment process in line with the requirements set for submarine atmosphere control – This process is documented in BR1326 chapter 6. DES NAG SM-Atm1 has the responsibility for assessing materials for internal submarine use. Enquiries regarding material assessments should therefore in the first instance be directed to DESNAG-SMAtmTox@mod.uk at MOD Abbeywood South, Bristol, BS34 8JH. Tel. 030 679 35045.

4.4 In-Service Submarines then have to be contacted and provide a risk assessment to the whole boat, and Clearance For Use (CFU) of a product (This is for Vanguard and Trafalgar class, and Astute platform). CFU is obtained through the nominated ISM Platform Safety Co-ordinator, DESSMIS-SSG-Con1@mod.uk, Tel. 0117 9161435.

4.5 Not all of the Astute class has been adopted by in service submarines so Clearance For Use can be sought from the Design Authority – BAE systems.
Engineering Manager Non Metallic Materials BAE SYSTEMS - Submarine Solutions
Phone: 01229 873980
Mobile: 07525 079325
Fax: 01229 874294
Email: Derek.Scholes@baesystems.com

5. WHOLE SHIP SPECIFICATIONS

5.1 The Whole Ship Specifications were submitted by seven major marine paint manufacturers / suppliers and are detailed in their respective annexes to this document. **All** of these companies must be approached when tendering on a new build project to conform to EU competitive law and to achieve VFM for the tax payer. It is considered advantageous to choose more than one company for an entire Class of RN vessel in order to engage more across all seven companies and put their differing products/technologies into service. New build paint specifications are no longer separately included as they so closely mirror refit, maintenance and repair.

5.1.1 The various paint manufacturers' annexes were originally inserted into WARPAINT in alphabetical order, with Chugoku Paints (UK) Ltd being listed first. It is important when searching for any particular coating or paint system, to ensure that the correct paint manufacturer is sourced and not to just turn to the first annex (i.e. Chugoku) for convenience.

5.1.2 The paint specifications in the annexes are the recommendations of the respective paint manufacturers. They are based on performance requirements, VOC and health and safety criteria of MOD(N). They are not specifications prescribed by MOD(N) and their fitness for purpose remains the responsibility of the paint manufacturer.

5.2 Items in the tables highlighted with a grey band do not fully meet MOD(N) criteria and are not to be used without prior confirmation from the relevant Platform Project Group. A number of these items may have obtained approval prior to the next issue of WARPAINT and readers should always check their current approval status.

5.3 To ensure that vessels allocated under the Whole Ship Specification concept receive paints from the selected supplier, their specific materials have been codified where necessary.

5.4 Tables

5.4.1 These include Nominal Dry Film Thickness (NDFT) per coat in micrometres (µm), as well as both the minimum and maximum recoat intervals. The figures quoted are meant for guidance only.

5.4.2 VOC grams per litre in the table highlighted thus in a box; do not comply with MoD VOC emission target levels.

5.4.3 Items with a '?' appearing in the boxes, indicate that manufacturer/supplier information is awaited.

5.4.4 Annexes are listed in alphabetical order as follows: -

Chugoku Paints (UK) Ltd	Annex A
Hempel Paints Ltd	Annex B
International Paint Ltd	Annex C
Jotun Paints (Europe) Ltd	Annex D
Maker Coating Systems Ltd	Annex E
PPG Protective & Marine Coatings (Sigma)	Annex F
Sherwin Williams Protective & Marine Coatings	Annex G

5.5 LCUs and LCVP's

5.5.1 In general LCU's and LCVP's follow the Whole Ship Specifications with the exception of Above Water Hull coatings where Chemical Agent Resistant Coatings (CARC) and Infra Red Resistant coatings (IRR) are specified. For advice, review of proposed Paint Specifications and queries in relation to these vessels contact WSpt-PEG-Husbandry or DESShipsWSpt-Amph-LC-TLM@mod.uk.

6. SPECIALIST COATINGS & PAINT REMOVERS

6.1 "WHOLE SHIP SPECIFICATIONS" & "SUBMARINES" Annexes do not cover Specialist areas. The following table lists specialist coatings & their location of use: -

SPECIALIST SYSTEMS/MATERIALS	Generic Type	VOC gms per ltr	NATO Stock Number	BR 1326
ANTIFOULING FOR "ARCHER" CLASS & YACHTS				
SUPERSPEED 52	Anti-Fouling	411	-	N/A
COPPERCOAT	Anti-Fouling	0	-	N/A
RUDDERS, STABILISERS & 'A' FRAMES **Corrosion, Erosion & Cavitation Protection** [Limpetite products use an approved Primer/Tie Coat system]				
LIMPETITE PRC (Single, thick coat system – fast application)	Liquid Rubber / Polyurethane	0		N/A
LIMPETITE A3 (Multiple coat system – slower application)	Liquid Synthetic Rubber	433		N/A
BELZONA 1311 Ceramic R-Metal (fill and fair)	Epoxy	0	99-720-9644	N/A
BELZONA 1341 Supermetalglide (cavitation protection) (2 coats. 3 coats if blasting prior to application of anti-foul)	Epoxy	5		N/A

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SPECIALIST SYSTEMS/MATERIALS	Generic Type	VOC gms per ltr	NATO Stock Number	BR 1326
HULL (Underwater-Applied Coatings) GENERAL REPAIR				
ALOCIT 28.15	Epoxy	0		N/A
BIOFIX 561 LT Black – Kevlar reinforced	Epoxy	0	99-133-9985	N/A
BELZONA 5831	Epoxy	0		N/A
INTERZONE 101 Trowel Grade – WARNING: Contains Silica	Epoxy	0		N/A
HULL - LINK COATS FOR FOUL RELEASE PAINT SYSTEMS				
Hempel Paints Ltd				
HEMPASIL NEXUS X-Seal 27600	Silicone	400		N/A
International Paints Ltd				
Link Coat for INTERSLEEK 737: INTERSLEEK 7180	Silicone	376		N/A
HPSW INTERNAL COATING FOR INTAKE PIPEWORK				
Belzona 1341	Epoxy	5		
Corroless RF35 Grey	Glass Flake Epoxy	93	99-337-0778	BLI
LIMPETITE A3 (Multiple coat system – slower application)	Liquid Synthetic Rubber	433		N/A
PEELABLE CORROSION-INHIBITING BARRIER COATING				
A&E Group				
Enviropeel (External/Weatherdeck applications only. Not for internal use.)	Thermoplastic	0		N/A
FLIGHTDECK / DECK MARKINGS				
Chugoku Paints (UK) Ltd				
521E0020 Type 1 White	Epoxy	374	99-541-9583	N/A
521E0013 Type 1 Black	Epoxy	374	99-543-0790	N/A
521E2947 Type 1 Red	Epoxy	374	99-543-0793	N/A
521E0013 Type 1 Green	Epoxy	374	99-5430-791	N/A
yellow				
Hempel Paints Ltd				
HEMPELS DECK MARKING 453GB White	Epoxy	347	99-323-1118	N/A
HEMPELS DECK MARKING 453GB Black	Epoxy	347	99-351-4222	N/A
HEMPELS DECK MARKING 453GB Red BS381C 537	Epoxy	347	99-724-9085	N/A
HEMPELS DECK MARKING 453GB Green BS381C 225	Epoxy	347	99-986-6762	N/A
yellow				
International Paints Ltd Use 852 for flight deck markings – Annex H.				
INTERSHIELD 740 White	Epoxy	420	99-773-8674	N/A
INTERSHIELD 740 Black	Epoxy	420	99-488-7443	N/A
INTERSHIELD 740 Red	Epoxy	420	99-377-5457	N/A
INTERSHIELD 740 Green	Epoxy	420	TBC	N/A
INTERSHIELD 740 Yellow	Epoxy	420	TBC	N/A
Sherwin-Williams Protective & Marine Coatings				
EPIDEK M377 White	Epoxy	330	99-777-8690	N/A
EPIDEK M377 Black	Epoxy	330	99-777-8692	N/A
EPIDEK M377 Green	Epoxy	330	99-777-8691	N/A
yellow				
red				
LCU & LVCP - CARC & IRR A/W HULL FINISH **Def Stan 80-208 approved coating - applied over Intergard 5000.**				
Trimite				
D00386 UK Army Brown	Polyurethane	TBC	TBC	N/A
D00341 Matt Black	Polyurethane	TBC	TBC	N/A

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SPECIALIST SYSTEMS/MATERIALS	Generic Type	VOC gms per ltr	NATO Stock Number	BR 1326
NAVIGATION LIGHT ENCLOSURES Matte Black Finish				
Sherwin-Williams Protective & Marine Coatings				
~~LEIGHS~~ Steel Spec™ M155	Alkyd Anti-Corrosive (150 DFT)	410	TBC	N/A
International Paints Ltd				
INTERLAC 497 **[Primer - Intergard 5000 (150 DFT) & Tie-Coat - Intergard 263 (75 DFT)]**	Alkyd Finish Coat (40 DFT)	391	TBC	N/A
INSTRUMENTS & ELECTRONIC EQUIPMENT PANELS Light Admiralty Grey BS381C 697	**Manufacturer Applied Coatings**			
Trimite				
SF59 Filler / SP59 Primer / S59 Top Coat	Stoved Epoxy	-	-	N/A
Onboard Repairs: Q55 (X has been dropped now all products are lead free)	Synthetic	491	99-224-9624	BLI
Indestructible Paints				
IP3-6700 epoxy primer	Epoxy	350	-	N/A
IP3-6971 epoxy finish	Epoxy	420	-	N/A
GALVANISED STEEL & ZINC METAL SPRAY (REPAIR)				
Maker Coatings				
ZINGA M	Polystyrene	539	13-113-7072	BLI
Hempel Paints Ltd				
HEMUDUR ZINC 18560	Water-Based Epoxy	60		
or				
HEMPEL'S ZINC PRIMER 16490	Zinc Phenoxy	590		
International Paints Ltd				
INTERZINC 22	Zinc Silicate	470		
or				
INTERZINC 72	Zinc Epoxy	410		B (CI, CF)
PPG Protective & Marine Coatings				
SIGMAZINC 19	Zinc Epoxy	584	99-152-6131	B LI
Sherwin-Williams Protective & Marine Coatings				
~~EPIGRIP~~ Zinc Clad® J984BS	Zinc Epoxy	331		
VARNISHED WOODWORK (high gloss, clear, protective finish)				
Chugoku Paints Ltd				
SPAR VARNISH	Varnish	433		
Hempel Paints Ltd				
HEMPEL'S MARINE VARNISH 02220 (prev. 022GB)	Alkyd	430	99-224-5783	BLI
International Paint Ltd				
INTERLAC 678	Alkyd	373	99-328-9646	BLI
Jotun Paints (Europe) Limited				
SPONTAN VARNISH	Urethane Alkyd	470	99-161-6220	
PPG Protective & Marine Coatings				
SIGMAVAR GLOSS 8103	Phenolic	393		
CORROSION INHIBITOR GREASE				
CORROLESS CCI 355	HD Grease	N/A	99-676-5736	BLI
CONDUCTIVE GLANDS (QEC requirement)				
Parker Chomerics				
Cho-shield 610	Copper Epoxy EMI	591	N/A	N/A
HEAT RESISTANT COATINGS (below 175 °C)				
PPG Protective & Marine Coatings				
SIGMATHERM 175	Modified Alkyd	561	-	BLI
International Paint Ltd (up to 250 °C)				
INTERTHERM 891	Oleoresinous Aluminium	425	-	-

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SPECIALIST SYSTEMS/MATERIALS	Generic Type	VOC gms per ltr	NATO Stock Number	BR 1326
HEAT RESISTANT COATINGS (above 250 °C)				
Hempel Paints Ltd				
HEMPEL'S GALVOSIL 15700	Zinc Silicate	435	99-593-8923	BLI
International Paint Ltd				
INTERTHERM 890	Zinc Silicate	305		BLI
PPG Protective & Marine Coatings				
SIGMATHERM 500	Modified Alkyd	600		BLI
Sherwin-Williams Protective & Marine Coatings				
~~Dex-Anode D5V2~~ Zinc-Clad II EU	Zinc Silicate	470		-
HEAT RESISTANT COATINGS (above 400 °C)				
Hempel Paints Ltd				
HEMPEL'S SILICONE ALUMINIUM 56910	Polysiloxane	585		
International Paint Ltd				
INTERTHERM 50	Silicone Aluminium	495	99-969-0549	BLI
PPG Protective & Marine Coatings				
SIGMATHERM 500	Modified Alkyd	600		BLI
SYSTEM FOR COATING NATURAL RUBBER MOUNTS *Applied by Mount OEM, not to be touched up once fitted.*				
Dunlop Precision Rubber Ltd				
DUNLOP NPL 100	Twin Pack			B
Maker Coating Systems Ltd				
GUMMIPAINT - Orange	Single Pack			BLI
PAINT REMOVER				
Cirrus Systems Ltd				
REMOVALL 520 (Caution advised if using large quantities. Respriatory protection.)	Biodegradable	N/A	-	BLI*
N A Robson Ltd				
BACK TO NATURE VIII	Biodegradable	N/A	99-361-6273	BLI
International Paint Ltd				
INTERPLUS 634	Biodegradable	N/A	99-551-8994	CI
Maker Coating Systems Ltd				
SEA TO SKY SPC-203	Biodegradable	N/A	20-003-3432	CI
RUST STAIN REMOVER				
International Paint Ltd				
INTERPLUS 614 (20L – Shelf Life 18months max.)	Biodegradable	N/A	99-870-1799	N/A
(Corrosion source / issue must be rectified before use. 6 - 16hrs dwell time. Cover with Polythene to keep wet. Excessive orders require suitable justification.)				
UNIQUE IMMERSED AREAS - PUMPS ETC				
Corrocoat Limited				
CORROGLASS 202	Polyester Glass Flake			
CORROGLASS 232	Polyester Glass Flake			
CORROGLASS 602	Vinyl Ester Glass Flake			
CORROGLASS 632	Vinyl Ester Glass Flake			
POLYGLASS VE	Vinyl Ester Glass Flake			
POLYGLASS VE HAND APPLIED	Vinyl Ester Glass Flake			
POLYGLASS VEF	Vinyl Ester Glass Flake			
POLYGLASS ZIPCOAT	Polyester Glass Flake			
CORROCOAT ZIP E	Glass Flake Epoxy			

*Advance BR1326 assessment from INM. Full request via SMTD required.

6.2 Cleaning Materials and Rust Removers

DES Ships WSpt-PEG-Husbandry is the Ship Husbandry (inc. Paint) & Habitability desk officer. All enquiries regarding cleaning materials and rust removers should be emailed to DESShipsWSpt-PEG-Husbandry@mod.uk alternatively telephone 030 679 36606.

BR2203 Ship Husbandry Manual dated Feb 2015 is now available on DII - http://defenceintranet.diif.r.mil.uk/Organisations/Orgs/Navy/Organisations/Orgs/DRes/HdCOMMS/Pages/BRs2000-2999.aspx. This is a major update in terms of information supplied. There is still commercial work to be done to procure new Cleaning Products and Equipment but the requirements are now in place to proceed.

6.3 Specialist Coatings Suppliers contact details:

Superspeed 52	H Marcel Guest	Tel 01612 057631
Coppercoat	Aquarius Marine Coatings Ltd.	Tel 01258 861059
Limpetite	Bristol Metal Spraying & PC Ltd	Tel 01179 662206
BIOFIX 561LT	Maker Coating Systems Ltd	Tel 01392 822600
Interzone 101	International Paint	Tel 01489 775060
Alocit & Enviropeel	A&E Group	Tel 01362 694915
Chemi-Tech UW	Thortex Ltd	Tel 01609 780170
MMP Repairite	MMP International	Tel 08704 587781
Belzona	Belzona Polymerics Ltd	Tel 01423 567641
S*59	Trimite	Tel 01895 201444
IP3-6* **	Indestructible Paint	Tel 01217 022485
Zinga	Maker Coating Systems Ltd	Tel 01392 822600
Gummipaint-Orange	Maker Coating Systems Ltd	Tel 01392 822600
Removall 510	Cirrus Systems Ltd	Tel 01305 822659
Back to Nature VIII	N A Robson Ltd	Tel 01253 393406
Sea to Sky SPC-203	Maker Coating Systems Ltd	Tel 01392 822600
Corroglass & Polyglass	Corrocoat Ltd	Tel 01132 760760

7. PAINTING AND PRESERVATION HOT TOPICS

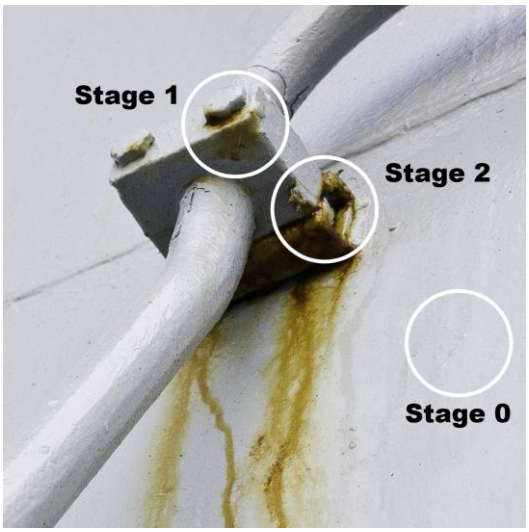
7.1 Relevant news stories, direct questions on approved coatings or paint systems and all matters regarding preparation standards, NATO stock numbers and MOD(N) Paint Policy can be directed to DES Ships WSpt-PEG-Husbandry.

7.2 MIXING OF PAINT SYSTEMS & USE OF CORROLESS QDR PRIMER

7.2.1 The mixing of different suppliers coatings in any given paint system is prohibited. If it becomes essential then it will only be permitted with the written approval of the relevant MOD Platform Project Group.

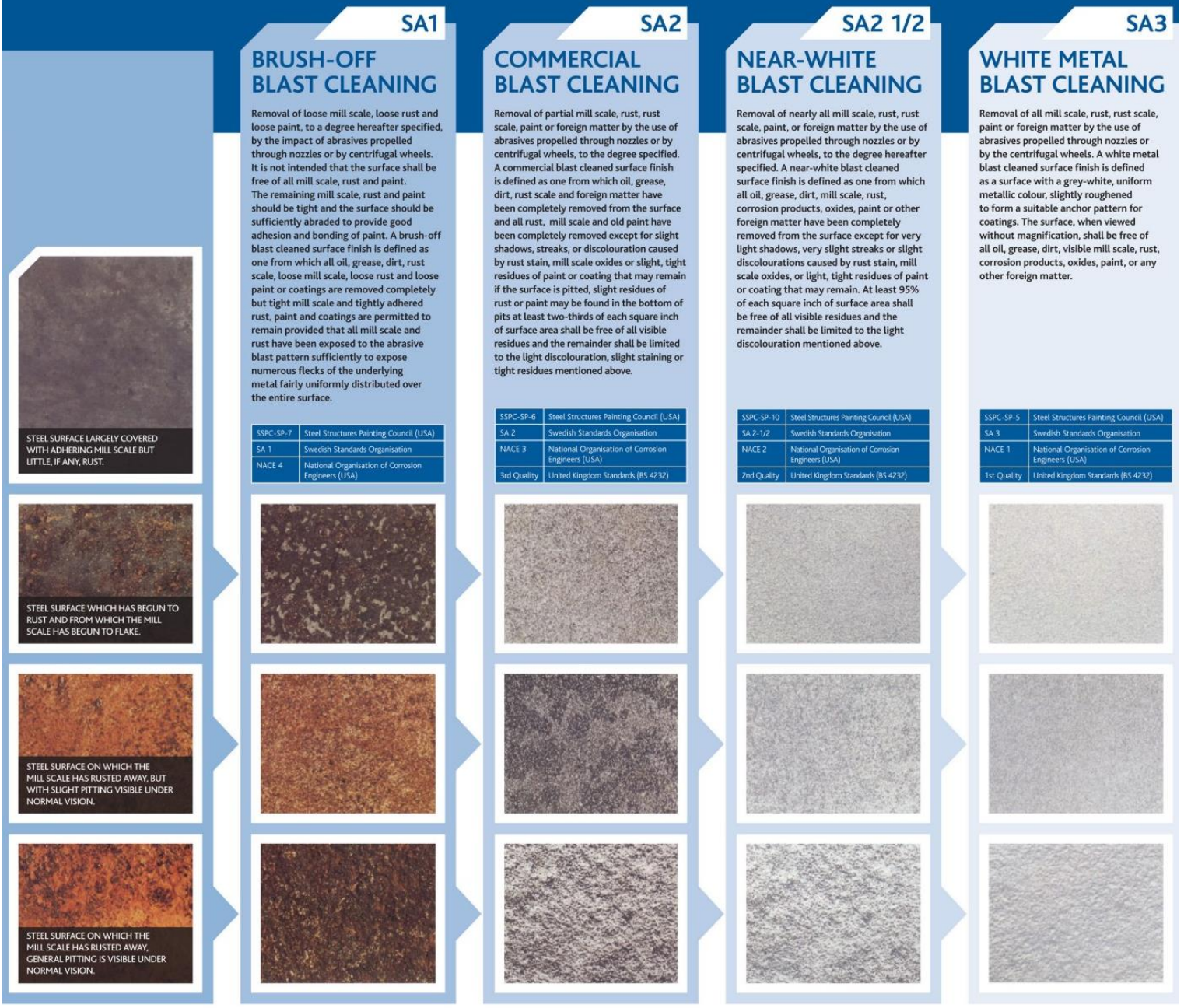
7.2.2 ***Corroless QDR primer is ONLY to be used for emergency repairs***, for example; when a vessel has to sail and welding of items has only just been completed or; there is insufficient time to apply the full WARPAINT specified paint system. Not more that 2 x 5 litre packs are to be carried onboard and **general usage is forbidden**.

8. THE 4 STAGES OF CORROSION: How to identify through routine survey.



Stage 0	No visible signs of corrosion. No indications of paint system defects. No visible sign of oxidation products.
Stage 1	General surface corrosion is visible. Small blisters or cracks in the paint coating. Red / Orange rust staining becoming evident & deposits from water run-offs developing.
Stage 2	Heavy corrosion is visible. Severe blister or cracking in the paint coating. Prominent rust staining is now visible with medium to heavy deposits from water run-offs.
Stage 3	Severe corrosion has resulted in visible metal loss at the point of attack to the point that structural integrity may have been compromised. Very prominent rust staining is visible, with heavy deposits from water run-offs
Stage 4	Complete perforation of the base metal has occurred and structural integrity has been lost.

STEEL SURFACE FINISHING STANDARDS



ACHIEVING THE BEST FINISH

The finish surface achieved by abrasive blast cleaning depends upon the original surface condition as well as the type of abrasive blasting equipment, size, hardness, type and abrasive shape.

THE ORIGINATING SURFACE CONDITION OF STEEL IS:

- Steel surface largely covered with adhering mill scale by little, if any, rust.
- Steel surface which has begun to rust and from which the mill scale has begun to flake.
- Steel surface on which the mill scale has rusted away or from which it can be scraped, but with slight pitting visible under normal vision.
- Steel surface on which the mill scale has rusted away and on which general pitting is visible under normal vision.

SURFACE CLEANLINESS IS DIVIDED INTO FOUR GRADES:

- SA 1 Brush off.
- SA 2 Commercial.
- SA 2-1/2 Near white metal.
- SA 3 White Metal.

Besides cleanliness of the steel, consideration needs to be given to the etch or profile roughness created by the impact of the abrasive on the steel surface.

THE SUBSTRATE PROFILE IS REGULATED BY:

- Shape, type and grading of abrasive.
- Blasting method and velocity of abrasive impaction.
- Steel condition prior to blasting.

The etched profile of the surface enables adhesion of the protective paint coatings. If the level at which this is achieved is too severe it will cause a waste of paint. If too light, it may cause a lack of adhesion.

The best method of obtaining a profile specification is to ensure the correct blasting equipment and method are combined with the correct abrasive. Once these requirements have been decided upon, the selection of method, equipment and training of personnel should be instigated.

Equipment used for surface preparation must be extremely reliable and simple to use. Operation information and training should be up-to-date.

Airblast has become the industry standard for manufacturing and supplying surface finishing equipment worldwide through a network of branch-offices as well as distributors.

This useful guide is from Airblast Eurospray website - http://www.airblast.co.uk/steel-surface-finishing-standards-chart.html

SURFACE PREPARATION is the essential first stage treatment of a steel substrate before the application of any coating, and is generally accepted as being the most important factor affecting the total success of a corrosion protection system.

The performance of a coating is significantly influenced by its ability to adhere properly to the substrate material. Residual millscale (dark oxide layer post steel manufacture) on steel surfaces is an unsatisfactory base to apply modern, high performance protective coatings and is therefore removed by abrasive blast cleaning. Other surface contaminants on the rolled steel surface, such as soluble salts, oil and grease are also undesirable and must be removed *before* the blast cleaning process.

The surface preparation process not only cleans the steel, but also introduces a suitable profile to receive the protective coating.

Initial surface condition

Structural steel elements in new structures are usually either hot rolled sections or fabricated plate girders. The initial steel surfaces normally comply with rust grades A or B according to ISO 8501-1. Material that is pitted, i.e. rust grades C or D, should be avoided if possible, since it is difficult to clean all the corrosion products from the pits during surface preparation. Descriptions of rust grades A to D are are detailed on page 14 above.

Automatic blast cleaning

Manual blast cleaning

Methods of preparation and grades of cleanliness

Various methods and grades of cleanliness are presented in ISO 8501-1. This standard essentially refers to the surface appearance of the steel after hand cleaning, power tool cleaning, abrasive blast cleaning or flame cleaning and gives descriptions with pictorial references of the grades of cleanliness.

Hand and power tool cleaning

Surface cleaning by hand tools such as scrapers and wire brushes is relatively ineffective in removing mill scale or adherent rust. Power tools offer a slight improvement over manual methods and these methods can be approximately 30% to 50% effective but are not usually utilised for new steelwork fabrications. Where it is not possible to clean by abrasive blasting, hand and power tool methods may be the only acceptable alternative methods. Generally used for ≤0.5m2 areas otherwise it is not efficient.

Modern power tooling has been developed not only to achieve a good standard of surface cleanliness ***and*** profile but also to provide near total containment of all dust and debris generated. New equipment is now available to use all within a vacuum shroud to enable on-site surface preparation to be environmentally acceptable. Pictorial examples are below.

The surface preparation by hand and power tools is covered by BS EN ISO 8504-3, and the standard grades of cleanliness in accordance with ISO 8501-1 are:

- St. 2: Thorough hand and power tool cleaning
- St. 3: Very thorough hand and power tool cleaning

Wire Brush

Rotary Wire Brush

Rotary Angle Grinder

Bristle Blaster

Perago

Abrasive blast cleaning

By far the most significant and important method used for the thorough cleaning of mill-scaled and rusted surfaces is abrasive blast cleaning. This method involves mechanical cleaning by the continuous impact of abrasive particles at high velocities on to the steel surface either in a jet stream of compressed air or by centrifugal impellers. The latter method requires large stationary equipment fitted with radial bladed wheels onto which the abrasive is fed. As the wheels revolve at high speed, the abrasive is thrown onto the steel surface, the force of impact being determined by the size of the wheels and their radial velocity. Modern facilities of this type use several wheels, typically 4 to 8, configured to treat all the surfaces of the steel being cleaned. The abrasives are recycled with separator screens to remove fine particles. This process can be 100% efficient in the removal of mill scale and rust.

The standard grades of cleanliness for abrasive blast cleaning are detailed on page 14 above.

The cleaned surfaces should be compared with the appropriate reference photograph in the standard according to the specification.

A very wide range of abrasives is available. These can be non-metallic (metal slags, aluminium oxide, etc) and metallic (steel shot or grit, etc)

The particle size of the abrasive is also an important factor affecting the rate and efficiency of cleaning. In general terms, fine grades are efficient in cleaning relatively new steelwork, whereas coarse grades may be required for heavily corroded surfaces. The removal of rust from pitted steel is more easily effected by fine grades and, depending upon the condition of the steel surface, a mixture of grades may be required initially to break down and remove mill scale and clean in pitted areas.

Removal of soluble iron corrosion products

Depending upon the condition of the steelwork prior to blast cleaning, there may be surface contaminants present other than mill scale and rust. Initial steel surface conditions of Grades A to C are unlikely to be affected, however Grade D condition (steelwork that is pitted) could contain contaminants within the pits that may not be removed by the dry blast cleaning process. The testing for soluble iron corrosion products is not usually required for new steelwork but is sometimes carried out on steelwork which has been stored in an external environment for long periods of time and on existing structures undergoing maintenance treatments.

Wet abrasive blast cleaning

The introduction of water into an abrasive blast stream contributes to the reduction of the dust hazard, particularly when removing old lead based paints and water-soluble contaminants. Several methods of using water with abrasives have been developed. Conventional wet abrasive blast cleaning uses the same pressures as for conventional dry blasting and similar equipment. The water is usually introduced immediately behind the nozzle so that it is atomised and accelerated through the nozzle orifice along with the air and abrasive. Water can also be introduced in controlled amounts at the base of the blast pot and is then mixed with the air and abrasive as it passes along the blast hose.

A low pressure system exists in which water is injected into the air stream which then shrouds the air/abrasive mixture and prevents dust escaping during the blasting operation. The air/water pressure at the nozzle is relatively low; up to 7.0kgF/cm^2 (100lbF/in^2). Because of the low water to air ratio of the system, fine particulates of abrasive can remain on the steel surface and need to be removed by water washing. This method can produce a high visual standard of cleaning and is effective in removing a high proportion of soluble salts.

Some wet abrasive processes use inhibitors in the water to prevent rusting of the cleaned surface. It is important to establish whether any remaining traces of such inhibitors will be compatible with the paint coating to be applied subsequently. Generally, where inhibitors are not used, any surface rusting after wet abrasive blasting is usually removed by final light dry blast cleaning.

Ultra-high pressure water jetting

Ultra-high pressure water jetting over 1,700 bar (25,000psi) is gaining in popularity, partly because of its ability to remove high percentages of soluble salts from the steel surface. It has the advantage of not generating spent abrasive and not incurring the cost of abrasive disposal. Also, at the higher pressures, lower volumes of water are used, and this makes disposal costs lower than with traditional water blasting methods. Ultra-high pressure water jetting leaves a warm surface from which traces of residual water quickly dry, but does not generate sufficient heat to cause thermal stress in the steel surface.

The removal of a high proportion of soluble salts from the steel surface is seen to be the major advantage of ultra-high pressure water jetting. Rust and coatings are sheared and lifted from the surface relatively easily compared with other blasting methods. Soluble salts are removed more effectively because the steel profile generally remains unchanged.

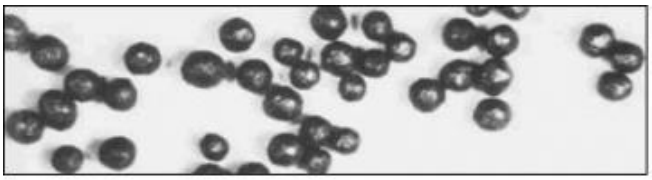
Injecting small amounts of abrasive into the water stream can induce a rougher surface profile but can also increase operating costs. The surface preparation by Ultra-high pressure water jetting is covered by ISO 8501-4.

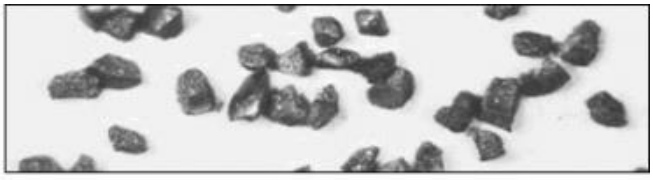
Ultra-high pressure water jetting is an extremely versatile and effective method of removing paint and metal coatings, soluble salts and other contaminants from steel surfaces. It is environmentally friendly and, although at present it is costly compared with traditional blast cleaning methods, it is considered to be an emerging technology which will, in the near future, rival and possibly replace traditional open abrasive blast cleaning methods.

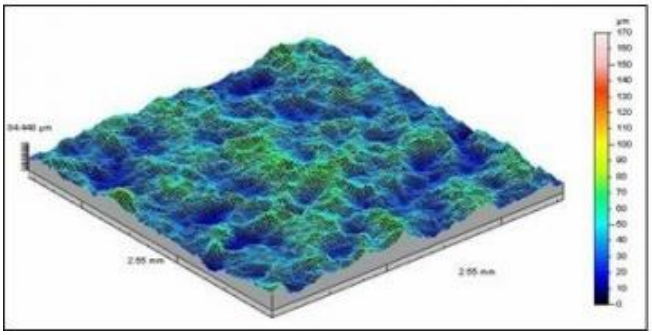
Surface profile and amplitude

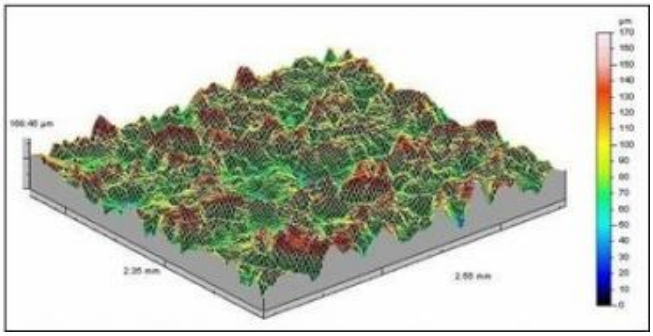
The type and size of the abrasive used in blast cleaning have a significant effect on the profile and amplitude produced. In addition to the degree of cleanliness, surface preparation specifications should also consider ‘roughness’ relative to the coating to be applied. High build paint coatings and thermally sprayed metal coatings need a coarse angular surface profile to provide a mechanical key. This is achieved by using grit abrasives. Shot abrasives are used for thin film paint coatings such as pre-fabrication primers.

The difference between shot and grit abrasives and the corresponding surface profiles produced is illustrated below in the three-dimensional diagrams obtained from noncontact surface characterisation equipment.









Shot abrasives

Grit abrasives

The surface treatment specification should describe the surface roughness required, usually as an indication of the average amplitude achieved by the blast cleaning process. Several methods have been developed to measure or assess the distance between the peaks and troughs of blast cleaned surfaces. These have included comparator panels, special dial gauges, replica tapes and traversing stylus equipment. Usually, comparators or replica tapes are used, and the relevant standards are BS EN ISO 8503-1 and BS EN ISO 8503-5 respectively.

Surface profile comparators

Replica tape method

Surface dust

The blast cleaning operation produces large quantities of dust and debris that must be removed from the abraded surface. Automatic plants are usually equipped with mechanical brushes and air blowers. Other methods can utilise sweeping and vacuum cleaning. However, the effectiveness of these cleaning operations may not be readily visible, and the presence of fine residual dust particles that could interfere with coating adhesion can be checked for using a pressure sensitive tape pressed onto the blast cleaned surface. The tape, along with any dust adhering to it, is then placed on a white background and compared to a pictorial rating. This method is described in BS EN ISO 8502-3. Although the standard provides a method of checking for dust, there are no recommendations for acceptable levels.

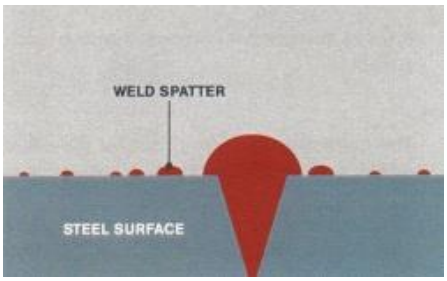
Surface condition immediately before coating

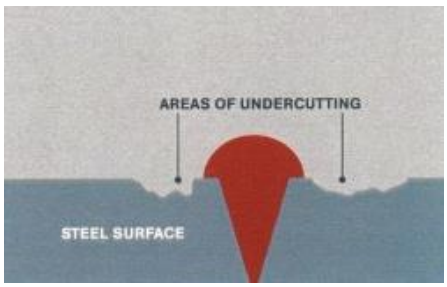
After the preparation of the surface to an acceptable standard of cleanliness and profile, it is important that the steelwork is not allowed to deteriorate. Re-rusting can occur very quickly in a damp environment and unless the steel is maintained in a dry condition coating of the surface should proceed as soon as possible. Any re-rusting of the surface should be considered as a contaminant and be removed by re-blasting.

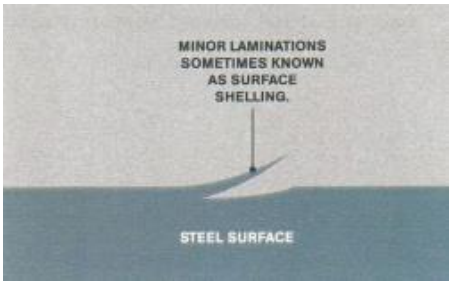
Additional surface treatments

After abrasive blast cleaning, it is possible to examine for surface imperfections and surface alterations caused during fabrication processes, e.g. welding. Certain surface imperfections introduced during the original processing of the steel may not be detrimental to the performance of a coating in service, particularly for structures in relatively low risk environment categories. However, depending upon the specific requirements of the structure, it may be necessary to remove general surface imperfections on welds and cut edges to produce an acceptable surface condition for painting.

Weldments on fabricated structural steelwork represent a relatively small but important part of the structure and can produce variable surface profile and uneven surfaces or sharp projections that can cause premature failure of the coating. Although welded areas are inspected, the requirements for weld quality do not usually consider the requirements for coating. Welds must be continuous and free from pinholes, sharp projections and excessive undercutting. Weld spatter and residual slags should also be removed.





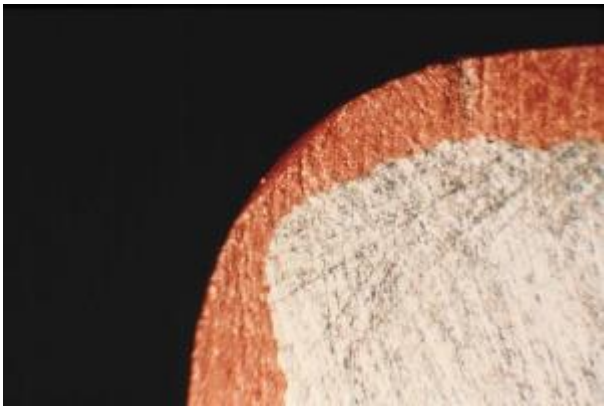


BS EN ISO 8501-3:2006 describes preparation grades of welds, cut edges and other areas, on steel surfaces with imperfections to make the steel surfaces suitable for the application of coatings. Three preparation grades are described, with illustrated examples of relevant imperfections, as:

- P1- Light Preparation
- P2 - Thorough Preparation
- P3 - Very Thorough Preparation

The selected preparation grade is correlated with the environment corrosivity category (C1 to C5 as described in BS EN ISO 12944 Part 2) as appropriate for the structure.

Sawn and flame-cut ends and edges need treatment to ensure that the coating adheres and is of sufficient thickness.



Cross-section showing reduction in coating thickness at a corner

At outside arrises (i.e. the meeting between two surfaces) there is a potential problem when there is a sharp (i.e. 90°) edge, because the fluid coating will not cover it properly (see above). Consequently, they should be smoothed by grinding or filing. It is generally considered sufficient to smooth the corner to a radius of about 2mm; chamfering to 45° is also effective, but it is difficult to avoid leaving some sharp edges when attempting this with hand tools. It can be argued that with modern high-build coatings and the use of stripe coats (an extra coat applied only locally), smoothing to a 1mm radius is adequate.

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ANNEX A
WHOLE SHIP SPECIFICATION
Proposed by

CHUGOKU PAINTS (UK) Ltd

Proposed Systems/Materials	Number of coats	NDFT per coat Microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
A & B. BELOW WATER HULL PRIMER ~							
Standard: BANNOH 1500	1	150	4.86	19 hrs	30 days	286	
Alternative: UMEGUARD HS SILVER	1	150	5.93	20 hrs	30 days	158	
Tie-coat (for C, E & F): BANNOH 1500 SZ	1	100	6.4	16 hrs	5 days	361	
C. ANTIFOULING FINISH (Self Polishing - SPC)							
SEA GRANDPRIX 1000L silyl hydrolysis	2	150	3.4	8 hrs	#	436	
D. ANTIFOULING SYSTEM (Foul Release – FRC 5+ yr life)							
BIOCLEAN SG R	1	125	4.86	6 hrs	24 hrs	406	
BIOCLEAN R	1	100	6.5	20 hrs	#	278	
BIOCLEAN HB pure silicone finish	1	150	3.55		#	261	
Propeller & Rudder:							
Etching Primer							
Epicon B100							
BIOCLEAN SG R	1	100	6	6 hrs	#	406	
BIOCLEAN R single pack silicone finish	1	200	3.25			278	
E. ANTIFOULING FINISH (SPC 3+ yr life)							
SEA GRANDPRIX 660HS fusion	1	150	4.46	8 hrs	#	324	
F. BOOTTOP ANTIFOULING FINISH (SPC)							
G & H. ABOVE WATER HULL & SUPERSTRUCTURE PRIMER							
Standard: BANNOH 1500	1	150	4.86	19 hrs	30 days	286	
Alternative: BANNOH 200 (for KEYSOL) - pending INM assessment							
Alternative: UMEGUARD SX HS GREY Surface Tolerant	1	125	5.92	28 hrs	30 days	233	
J. ABOVE WATER HULL & SUPERSTRUCTURE FINISH Light Weatherwork Grey BS381C 676							
CAMLAC HD WEATHERWORK FINISH silicone alkyd	1	40	11.80	16 hrs	#	400	
EPICON AE epoxy acrylic - pending INM assessment							
KEYSOL polysiloxane - pending INM assessment							

ANNEX A
WHOLE SHIP SPECIFICATION
Proposed by

CHUGOKU PAINTS (UK) Ltd

Proposed Systems/Materials	Number of coats	NDFT per coat Microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
K. FLIGHT & WEATHERDECK SYSTEMS – DEF STAN 80-134							
Primer: UMEGUARD HS SILVER	1	125	7.40	20 hrs	30 days	158	
(a). Hangar Doors Finish Light Weatherwork Grey BS381C 676							
[Factory finished - Interpon 610 – see International Paints WSS]							
(b). Flight & Weatherdeck - Type 2 Non-Skid Finish (coarse)							
CAMIDECK FINISH Type 2 Extra Dark Sea Grey BS381C 640	2	208	2.83	16 hrs	#	374	
CAMIDECK REPAIR KIT Type 2 available to order (2l)							
(c). Hangar & Weatherdeck -Type 1 Non-Skid Finish (fine)							
CAMIDECK FINISH Type 1 Hangardeck: Dark Admiralty Grey BS381C 632 Weatherdeck: Extra Dark Sea Grey BS381C 640	2	190	2.84	16 hrs	#	374	
CAMIDECK REPAIR KIT Type 1 available to order (2l)							
(d). Gloss for Deck Margins: Extra Dark Sea Grey BS381C 640							
UMEGUARD HS GREY	2	75	11.86	20 hrs	30 days	158	
L & M. INTERIOR DRY SPACES							
Primer: BANNOH 1500	1	125	5.84	19 hrs	30 days	286	
Finish: AQUALIFE GLOSS FINISH BS4800 00A01	2	40	10	16 hrs	7 days	132	99-757-9334
N & O. INTERIOR WET SPACES							
Primer: BANNOH 1500	1	125	5.84	19 hrs	30 days	286	
Standard Finish: AQUALIFE GLOSS FINISH Ash Grey BS4800 00A01	2	40	10	16 hrs	7 days	132	99-757-9334
Citadel Lobby Finish: AQUALIFE GLOSS FINISH - Colour either BS4800 00A01 or Grey BS381C 676	2	40	10	16 hrs	7 days	132	99-757-9334
Cleansing Stations Finish: AQUALIFE GLOSS FINISH White	2	40	10	16 hrs	7 days	132	
Magazine Finish: AQUALIFE GLOSS FINISH BS4800 00A01	2	40	10	16 hrs	7 days	132	99-757-9334
P. INTERIOR DECKS Green 14C39							
Standard Primer: AQUALIFE WSE PRIMER	2	50	9	16 hrs	#	0	99-398-1182
Finish: AQUALIFE FINISH	2	40	10	16 hrs	7 days	132	99-755-6242
Cleansing Stations Primer: BANNOH 1500	1	125	5.84	19 hrs	30 days	286	
Finish: AQUALIFE GLOSS FINISH	2	40	10	16 hrs	7 days	132	99-755-6242

ANNEX A
WHOLE SHIP SPECIFICATION
Proposed by

CHUGOKU PAINTS (UK) Ltd

Proposed Systems/Materials	Number of coats	NDFT per coat Microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Q. BATTERY COMPARTMENTS							
Primer: BANNOH 1500	1	125	5.84	19 hrs	30 days	286	
Finish: AQUALIFE GLOSS FINISH BS4800 00A01	2	40	10	16 hrs	7 days	132	99-757-9334
R. CABLE LOCKERS & COFFERDAMS							
BANNOH 1500	2	125	5.84	19 hrs	30 days	286	
S. BLACK/GREY & WATER BALLAST TANKS IMO PSPC							
BANNOH 1500 red	1	160	4.56	19 hrs	30 days	286	
BANNOH 1500 grey	1	160	4.56	19 hrs	30 days	286	
T. MACHINERY SPACE BILGES							
BANNOH 1500	2	125	5.84	19 hrs	30 days	286	
U. AVCAT, DIESO, LUB & HYDRAULIC OIL TANKS SYSTEM DEF STAN 80-97 (HIGH SOLIDS)							
EPICON T-800	2	125	5.2	24 hrs	28 days	359	
BANNOH 1500	2	125	5.84	19 hrs	30 days	286	
V. POTABLE WATER TANKS							
CLEANKEEP 5000	1(2)	300(150)	3.33	48 hrs	7 days	0	
W. AQUEOUS FILM-FORMING FOAM (AFFF) TANKS							
EPICON T-800	2	125	4.56	12 hrs	7 days	407	
X. DEMINERALISED WATER TANKS (Max Temperature 90°C)							
EPICON T-800	2	125	4.56	12 hrs	7 days	407	
EPICON T-800 HS-GF glass flake	2	125	5.28	24 hrs	7 days	349	
Y. EPOXY HOLDING PRIMER							
NZ PRIMER S	1	25	15.9	16 hrs	#	641	

ANNEX A
WHOLE SHIP SPECIFICATION
Proposed by

CHUGOKU PAINTS (UK) Ltd

Proposed Systems/Materials	Number of coats	NDFT per coat microns	Theo SP m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Z. PRIMERS FOR NON-FERROUS METALS & FRP							
Aluminium: ALP 500	1	50	11.6	10 hrs	#	414	99-967-8636
Stainless Steel: BANNOH 1500 or EPICON S100 pending INM assessment	1	125	5.84	19 hrs	30 days	286	
Zinc Spray & Galvanise: GALVANITE 200	1	30	14.10	4 hrs	30 days	587	99-290-5829
FRP Indicator coat: CLEANKEEP 5000	1	300	3.33	48 hrs	7 days	0	

Notes:

1. The recoat intervals published above are based on the manufacturer's figures quoted for 20°C

2. The number of coats stated in the above table, relate to airless spray application to achieve the stated dry film thickness (NDFT). Should brush application be required for touch up and repair then additional coats may be necessary to achieve the required NDFT.

3. **#** = No maximum recoat interval, see Manufacturer's Technical Data Sheet/Application Instructions for requirements.

4. It is important to ensure that surfaces are clean and free of contamination when overcoating materials, that have been left exposed, this is especially true for those products with an indefinite recoat interval.

5. The Theoretical Spreading Rate (TSR) quoted in the table above is calculated from the coatings physical constants and makes no allowance for loss and assumes a totally smooth surface. The actual spreading rate achieved Practical Spreading Rate (PSR) is dependent upon many factors and in practice the factor used may vary from as little as 1.05 up to as much as 4+. It is usual for paint manufactures to use figures of 1.3 or 1.4 for estimating purposes but they always add the caveat that actual consumption achieved may vary due to such factors as surface profile, wastage due to material left in the can, weather conditions, skill of operator etc.

6. **~** = Use blast primer **Y.** when appropriate

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ANNEX B
WHOLE SHIP SPECIFICATION
Proposed by

HEMPEL UK LTD

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
A & B. BELOW WATER HULL PRIMER ~							
Standard: HEMPADUR 45880 MIO 12430	1	175	4.6	8 hrs	30 days	198	99-803-7233
Alternative: HEMPADUR QUATTRO 17634	1	175	4.1	6 hrs	90 days	275	
Tie Coat for **C,E&F**: HEMPADUR 47182	1	100	6.2	9 hrs	5 days	364	
Tie Coat for **D**: HEMPEL NEXUS 27310	1	100	5.6	6 hrs	20 hrs	388	
Tie Coat For **D**: HEMPEL NEXUS 27500 (repair only)	1	125	5.2	8 hrs	48 hrs	259	
C. ANTIFOULING FINISH (Self Polishing - SPC)							
5 year life: HEMPEL GLOBIC 6000 (75950)	2	120	5.8	10 hrs	#	383	
7 Year life: HEMPEL GLOBIC 9000 (78950)	2	140	4.1	10 hrs	#	367	
D. ANTIFOULING FINISH (Foul Release - FRC 5+ yr life)							
HEMPASIL X3 87500 Silicone	1	150	4.7	6 hrs	#	265	
HEMPAGUARD X7 89900 Hydrogel c/w Biocides	1 *CW*	150	4.7	6 hrs	48 hrs	262	
Seek approval. Operational req'ment req'd due to additional H&S risks.	2 *WW*	100	7	6 hrs	48 hrs	262	
* Cold & Warm Water systems provided *							
E. ANTIFOULING FINISH (SPC - 3+ year life)							
Standard: GLOBIC 6000 (75950)	2	100	5.8	8 hrs	#	383	
Alternative: OLYMPIC + (72950)	2	100	5.0	8 hrs	#	367	
F. BOOTTOP ANTIFOULING FINISH (SPC)							
Standard: GLOBIC 6000 (75950)	2	100	5.8	8 hrs	#	383	
Alternative: OLYMPIC + (72950)	2	100	5.0	8 hrs	#	367	
G & H. ABOVE WATER HULL & SUPERSTRUCTURE PRIMER							
Standard: HEMPADUR 45880 MIO 12430	1	150	4.6	8 hrs	30 days	198	99-803-7233
Alternative: HEMPADUR QUATTRO 17634	1	175	4.1	6 hrs	90 days	275	
Touch-up: HEMUCRYL PRIMER 18100	2	30	15.7	4 hrs	#	61	99-909-6026
J. ABOVE WATER HULL & SUPERSTRUCTURE FINISH Light Weatherwork Grey BS 381C 676							
Acrylic: HEMPEL'S PRO ACRYLIC 55880	1	50	11.0	12 hrs	#	380	
Silcone Alkyd: HEMPELS SILICONE ALKYD FINISH 536GB	1	35	15.4	8 hrs	1-2 days	410	99-772-5448
Tie Coat – (if req'd): HEMPEL'S UNDERCOAT 424GB	1	40	12.5	8 hrs	7 days	385	99-224-6752
Sealer for RASH: HEMUCRYL 18100	1	30	15.7	4 hrs	#	61	99-909-6026

ANNEX B
WHOLE SHIP SPECIFICATION
Proposed by

HEMPEL UK LTD

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
K. FLIGHT & WEATHERDECK SYSTEMS - DSTAN 80-134							
(a) Hangar Doors							
[Factory finished - Interpon 610 – see International Paints WSS]							
(b) Flight & Weatherdeck - Type 2 Non-Skid Finish (coarse)							
Primer: HEMPADUR 45880 MIO 12430	1	100	8.0	7 hrs	#	198	99-803-7233
Finish: HEMPEL'S NON SKID 45710 Extra Dark Sea Grey BS 381C 640	2	400	1.9	6 hrs	30 days	206	99-831-0343
Type 2 Repair Kit: HEMPEL'S DECK REPAIR KIT 941 GB Extra Dark Sea Grey BS 381C 640							99-340-2100
(c) Hangar & Weatherdeck - Type 1 Non-Skid Finish (fine)							
Primer: HEMPADUR 45880 MIO 12430	1	100	8.0	7 hrs	#	198	99-803-7233
Hangar Deck - Finish: HEMPEL'S NON SKID 45340 Dark Admiralty Grey BS 381C 632	2	200	3.2	6 hrs	30 days	335	99-670-9581
Weatherdeck - Finish: HEMPEL'S NON SKID 45340 Extra Dark Sea Grey BS 381C 640	2	200	3.2	6 hrs	30 days	335	99-213-1121
Type 1 Repair Kit: HEMPEL'S DECK REPAIR KIT 942GB Extra Dark Sea Grey BS 381C 640							99-471-2960
(d) Gloss for Deck Margins: HEMPADUR 45143 Extra Dark Sea Grey BS 381C 640	2	125	5.0	3 hrs	30 days	330	
L & M. INTERIOR DRY COMPARTMENTS							
Standard Primer: HEMPADUR 45880	1	125	6.4	7 hrs	#	198	99-803-7233
Alternative Primer: HEMUCRYL High Build 18032	1	75	5.7	2 hrs	#	45	
Standard Finish: HEMUCRYL ENAMEL 58100 BS 4800 00A01	2	30	13.7	6 hrs	#	63	99-660-9288
Alternative Finish: HEMUDUR FC 48582 BS 4800 00A01	1	80	6.9	12 hrs	15 days	27	99-988-2715
N & O. INTERIOR WET COMPARTMENTS							
Standard Primer: HEMPADUR 45880 MIO 12430	1	125	6.4	7 hrs	#	198	99-803-7233
Alternative Primer: HEMPADUR QUATTRO 17634	1	125	5.8	5 hrs	#	275	
Standard Areas Finish: HEMUDUR FC 48582 BS 4800 00A01	1	80	6.9	12 hrs	15 days	27	99-988-2715
Citadel Lobby Finish: HEMUDUR FC 48582 BS 4800 00A01 or Grey BS 381C 676	1	80	6.9	12 hrs	15 days	27	99-988-2715
Cleansing Stations Finish: HEMPADUR 45143 White	1	100	6.0	8 hrs	#	375	99-602-7280
Magazine Use Finish: HEMUDUR FC 48582 BS 4800 00A01	1	80	6.9	1 hrs	15 days	27	99-988-2715

ANNEX B
WHOLE SHIP SPECIFICATION
Proposed by

HEMPEL UK LTD

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
P. INTERIOR DECKS BS 4800 Green 14C39							
Primer: HEMPADUR 45880 MIO 12430	1	125	6.4	7 hrs	#	198	99-803-7233
Finish: HEMUDUR FC 48582	1	80	6.9	12 hrs	15 days	27	99-279-8221
Cleansing Station Finish: HEMPADUR 45143	1	100	6.0	8 hrs	#	375	99-471-1920
Q. BATTERY COMPARTMENTS BS 4800 00A01							
Primer: HEMPADUR 45880 MIO 12430	1	150	6.0	8 hrs	#	198	99-803-7233
Finish: HEMUDUR FC 48582	1	80	6.9	12 hrs	15 days	27	99-988-2715
R. CABLE LOCKERS & COFFERDAMS							
HEMPADUR 45880 White	1	150	6.0	8 hrs	#	217	99-264-0387
S. BLACK/GREY & WATER BALLAST TANKS IMO PSPC							
Water Ballast Tanks: HEMPADUR QUATTRO 17634	2	160	4.5	6 hrs	90 days	275	
Black & Grey Water Tanks: HEMPADUR 85671	3	100	6.8	36 hrs	5 days	320	
T. MACHINERY SPACE BILGES							
HEMPADUR 45880 White	2	125	6.4	7 hrs	#	217	99-264-0387
U. AVCAT, DIESO, LUB & HYDRAULIC OIL TANKS SYSTEM - DEF STAN 80-97 (HIGH SOLIDS)							
HEMPADUR 85671	3	100	6.8	36 hrs	21 days	320	
V. POTABLE WATER TANKS							
Standard: HEMPADUR MULTI STRENGTH 35530	2	200	5.0	24 hrs	5 days	10	
Alternative: HEMPADUR MULTI STRENGTH 35560	2	200	5.0	24hrs	30 days	0	
W. AQUEOUS FILM-FORMING FOAM (AFFF) TANKS							
HEMPADUR 85671	3	100	6.8	36 hrs	21 days	320	
X. DEMINERALISED WATER TANKS(MaxTemperature 90°C)							
HEMPADUR 85671	3	100	6.8	36 hrs	21 days	320	
Y. EPOXY HOLDING PRIMER							
HEMPADUR 15570	1	40	13.5	#	#	420	99-943-1152

ANNEX B
WHOLE SHIP SPECIFICATION
Proposed by

HEMPEL UK LTD

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Z. PRIMERS FOR NON-FERROUS METALS & FRP							
Aluminium, Stainless Steel, Zinc Spray & Galvanised surfaces:							
Standard: HEMUCRYL TIE COAT 18200 (1 pack)	1	20	19	24 hrs	#	40	99-199-2908
Alternative: HEMPADUR 15553 (2 pack)	1	50	11	2 hrs	#	400	99-870-0653
FRP Indicator Coat: HEMPADUR MULTI STRENGTH 35530	1	200	5	24 hrs	5 days	10	
Using Y. Epoxy Holding Primer as tie coat for subsequent coats @	1	100/125		#	#	420	99-943-1152
HIGH PROTECT 35651 grey (repair only)	1	200	5	8 hrs	5 days	10	99-517-4318

Notes:

1. The recoat intervals published above are based on the manufacturer's figures quoted for 20°C
2. The number of coats stated in the above table, relate to airless spray application to achieve the stated Nominal Dry Film Thickness (NDFT). Should brush application be required for touch up and repair then additional coats may be necessary to achieve the required NDFT.
3. # See Manufacturer's Technical Data Sheet/Application Instructions for requirements.
4. It is important to ensure that surfaces are clean and free of contamination when overcoating materials, that have been left exposed, this is especially true for those products with an indefinite recoat interval.
5. The Theoretical Spreading Rate (Theo SR) quoted in the table above is calculated from the coatings physical constants and makes no allowance for loss and assumes a totally smooth surface. The actual spreading rate achieved (Practical SR) is dependent upon many factors and in practice the factor used may vary from as little as 1.05 up to as much as 4+. It is usual for paint manufactures to use figures of 1.3 or 1.4 for estimating purposes but they always add the caveat that actual consumption achieved may vary due to such factors as surface profile, wastage due to material left in the can, weather conditions, skill of operator etc.
6. **~** = Use blast primer **Y.** when appropriate.

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ANNEX C
WHOLE SHIP SPECIFICATIONS
Proposed by

INTERNATIONAL PAINT LTD

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms Per ltr	NATO Stock Number
A & B. BELOW WATER HULL PRIMER ~							
Standard: INTERGARD 5000	1	175	4.68	12 hrs	2 months	179	
Alternative: INTERSHIELD 300 Foul Release only (Area D)	2	125	4.80	7 hrs	14 days	313	
Tie Coat for C: INTERGARD 263	1	75	7.60	8 hrs	5 days	379	99-133-3854
Tie Coat for D (if req'd): INTERSLEEK 737	1	100	6.5	4 hrs	7 days	325	
C. ANTIFOULING FINISH (Self Polishing - SPC)							
5 year life: INTERSMOOTH 7460	2	125	3.20	12 hrs	28 days	425	
D. ANTIFOULING FINISH (Foul Release - FRC 5+ yr life) Red							
INTERSLEEK 970 Fluoropolymer	1	150	4.8	24 hrs	#	248	
INTERSLEEK 1100SR Slime Release Fluoropolymer	1	150	4.8	24 hrs	#	248	
E. ANTIFOULING FINISH (SPC)							
3 year life: INTERSPEED 6400 Black	1	150	4	6 hrs	3 months	358	
F. BOOTTOP ANTIFOULING FINISH (SPC) Black							
INTERSPEED 6400	2	60	10	6 hrs	3 months	358	
BOOTTOP ANTIFOULING FINISH (FR) Black							
Standard: INTERSLEEK 1100SR	1	150	4.8	24 hrs		248	
Repair: INTERSLEEK RAPID	1	150	4	24 hrs		350	99-358-0224
G. ABOVE WATER HULL & SUPERSTRUCTURE PRIMER							
INTERGARD 5000 Dawn Grey BS 4800 00A01	1	150	5.47	12 hrs	14 days	179	99-000-5256
J. ABOVE WATER HULL & SUPERSTRUCTURE FINISH BS 381C 676							
Polysiloxane: INTERFINE 878	1	50	14.4	4 hrs	#	246	99-274-4682
Epoxy Acrylic: INTERFINE 691 HS	1	50	10.6	8 hrs	#	409	99-864-5322
Undercoat / Tie Coat (if required): INTERGARD 263	1	75	7.6	8 hrs	5 days	379	99-133-3854

ANNEX C
WHOLE SHIP SPECIFICATIONS
Proposed by

INTERNATIONAL PAINT LTD

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litr	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms Per ltr	NATO Stock Number
K. FLIGHT & WEATHERDECK SYSTEMS – DEF STAN 80-134							
(a) Hangar Doors							
[Factory finished - Interpon 610 - powder coating]	1	100	N/A	N/A	N/A	0	
Markings: Epoxy Acrylic: INTERFINE 691 HS	1	50	10.6	8 hrs	#	409	
Polysiloxane: INTERFINE 878	1	50	14.4	4 hrs	#	246	
(b) Flight & Weatherdeck - Type 2 Non-skid Finish (coarse)							
Primer: INTERGARD 5000 Dawn Grey BS 4800 00A01	1	150	5.47	12 hrs	14 days	179	99-000-5256
Finish: INTERSHIELD 851 Extra Dark Sea Grey BS 381C 640	2	300	1.28	16 hrs	#	169	99-391-0953
Type 2 Repair Kit:							
INTERSHIELD 851 REP KIT – Extra Dark Sea Grey BS 381C 640							99-325-0579
(c) Hanger & Weatherdeck - Type 1 Non-skid Finish (fine)							
Primer: INTERGARD 5000 Dawn Grey BS 4800 00A01	1	150	5.47	12 hrs	14 days	179	99-000-5256
Hanger Deck: INTERSHIELD 852 Dark Admiralty Grey BS 381C 632	2	200	1.92	12 hrs	#	134	99-149-8996
Weatherdeck: INTERSHIELD 852 Extra Dark Sea Grey BS 381C 640	2	200	1.92	12 hrs	#	134	99-583-1344
Type 1 Repair Kit:							
INTERSHIELD 852 REPAIR KIT – Dark Admiralty Grey BS 381C 632							99-993-9328
(d) Gloss for Deck Margins							
INTERGARD 740 Extra Dark Sea Grey BS 381C 640	1	50	10.2	16 hrs	#	420	99-182-2627
L & M. INTERIOR DRY COMPARTMENTS							
Primer: INTERGARD 5000 Dawn Grey	1	125	6.56	12 hrs	#	179	99-000-5256
Finish: INTERCRYL 700 BS 4800 00A01	1 or 2	35	11.42	60 mins	#	50	99-799-8832
Alternative Finish: INTERSHEEN 5579	1 or 2	35	11.29	60 mins	#	12	
N & M. INTERIOR WET COMPARTMENTS (Complete Finish colour either White BS 4800 00A01 or Grey BS 381C 676							
Primer: INTERGARD 5000 Dawn Grey	1	125	6.56	24 hrs	#	179	99-000-5256
Standard Areas Finish: INTERGARD 1735	1 or 2	50	11.20	12 hrs	#	132	99-255-0527
Citadel Lobby Finish: INTERGARD 1735	1 or 2	50	11.20	12 hrs	#	132	99-255-0527
Cleansing Stations Finish: INTERFINE 979 (overcoat primer within 4 days)	1	125	7.60	4 hrs	#	165	99-168-7337
Magazines Finish: INTERGARD 1735	1 or 2	50	11.20	12 hrs	#	132	99-255-0527

ANNEX C
WHOLE SHIP SPECIFICATIONS
Proposed by

INTERNATIONAL PAINT LTD

Proposed system Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
P. INTERIOR DECKS BS 4800 Green 14C39							
INTERGARD 5000	1	150	5.47	#	#	179	99-555-1384
Cleansing Stations Finish: INTERFINE 979 (overcoat primer within 4 days)	1	125	7.60	4 hrs	#	165	99-729-7357
Q. BATTERY COMPARTMENTS							
INTERGARD 5000 BS 4800 00A01	1	150	5.47	12 hrs	#	179	
R. CABLE LOCKERS & COFFERDAMS							
INTERGARD 5000	1	150	5.46	12 hrs	3 months	179	
S. BLACK/GREY & WATER BALLAST TANKS IMO PSPC							
Water Ballast Tanks: INTERGARD 5000	2	160	5.13	12 hrs	3 months	179	
Black & Grey Water Tanks: INTERLINE 850	2	125	6.08	8 hrs	30 days	212	
Galley Grey Water Tanks: INTERLINE 994	3	100	7	44hrs	25 days	290	
T. MACHINERY SPACE BILGES							
INTERGARD 5000 White	1	175	4.68	12 hrs	3 months	179	
U. AVCAT, DIESO, LUB & HYDRAULIC OIL TANKS SYSTEM - DEF STAN 80-97 (HIGH SOLIDS)							
INTERLINE 850	2	125	6.08	8 hrs	30 days	212	
V. POTABLE WATER TANKS							
INTERLINE 925	1	300	3.33	18 hrs	3 days	1	
W. AQUEOUS FILM-FORMING FOAM (AFFF) TANKS							
INTERLINE 704	2	125	4.24	23 hrs	21 days	385	
X. DEMINERALISED WATER TANKS (Max Temperature 90°C)							
INTERLINE 925 (up to 60°C only)	1	300	3.33	18 hrs	3 days	1	
Y. EPOXY HOLDING PRIMER							
Standard: INTERGARD 269	1	30	15.67	6 hrs	#	411	99-983-0743
Alternative & Maintenance: INTERGARD 276	1	40	11.75	6 hrs	#	411	

ANNEX C
WHOLE SHIP SPECIFICATIONS
Proposed by

INTERNATIONAL PAINT LTD

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms Per	NATO Stock Number
Z. PRIMERS FOR NON-FERROUS METALS & FRP							
Aluminium, Stainless steel, Zinc Spray or Galvanised surfaces:							
Standard: INTERGARD 269	1	30	15.67	6 hrs	#	411	99-983-0743
Alternative: INTERGARD 276	1	40	11.75	6 hrs	#	411	
FRP Indicator Coat: INTERLINE 925 Cream	1	300	5.0	18 hrs	3 days	1	

Notes:

1. The recoat intervals published above are based on the manufacturer's figures quoted for 25°C
2. The number of coats stated in the above table, relate to airless spray application to achieve the stated Nominal Dry Film Thickness (NDFT). Should brush application be required for touch up and repair then additional coats may be necessary to achieve the required NDFT.
3. It is important to ensure that surfaces are clean and free of contamination when overcoating materials, that have been left exposed, this is especially true for those products with an indefinite recoat interval.
4. # See Manufacturer's Technical Data Sheet/Application Instructions for requirements.
5. The Theoretical Spreading Rate (Theo SR) quoted in the table above is calculated from the coatings physical constants and makes no allowance for loss and assumes a totally smooth surface. The actual spreading rate achieved (Practical SR) is dependent upon many factors and in practice the factor used may vary from as little as 1.05 up to as much as 4+. It is usual for paint manufactures to use figures of 1.3 or 1.4 for estimating purposes but they always add the caveat that actual consumption achieved may vary due to such factors as surface profile, wastage due to material left in the can, weather conditions, skill of operator etc.
6. **~** = Use blast primer **Y.** when appropriate

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ANNEX D
WHOLE SHIP SPECIFICATIONS
Proposed by

JOTUN COATINGS (EUROPE) LTD

Proposed Systems /Materials	Number of Coats	NDFT per coat microns	Theo SR m ²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per litre	NATO Stock Number
A & B. BELOW WATER HULL PRIMER ~							
Standard: JOTACOTE UNIVERSAL (alu. red toned)	1	200	3.6	4 hrs	#	240	
Alternative: JOTAMASTIC 87 ALUMINIUM (red toned)	1	200	4.4	10 hrs	#	110	
Alternative: MARATHON IQ (impact resistant - red)	1	500	2.0	10 hrs	3 days	30	
Tie Coat: SAFEGUARD UNIVERSAL ES (grey)	1	100	6.2	10 hrs	3 days	330	
C. ANTIFOULING (Self Polishing - SPC 5 yr life)							
Standard: SEAQUANTUM PLUS (light red)	1	125	3.8	7 hrs	#	460	
Alternative: SEAQUANTUM ULTRA (dark red)	2	125	3.8	7 hrs	#	460	
D. FOUL RELEASE (Foul Release - FRC 5+ yr life)							
SEALION TIECOAT (if req'd - light red)	1	90	6.6	15 hrs	4 days	406	
SEALION REPULSE Nano Repellant Silicone FR Topcoat	1	150	4.8	#	#	230	
E. ANTIFOULING (SPC - 3 year life)							
SEAFORCE 90 (light red)	1	105	5.5	7 hrs	#	370	
SEAFORCE 90 (dark red)	1	105	5.5	7 hrs	#	370	
F. BOOTTOP ANTIFOULING black							
Standard SPC: SEAQUANTUM CLASSIC	1 or 2	150	3.1	7 hrs	#	460	
Alternative FRC: SEALION TIECOAT (if req'd - light red)	1	90	6.6	15 hrs	4 days	406	
SEALION REPULSE	1	150	4.8	#	#	230	
G & H. ABOVE WATER HULL & SUPERSTRUCTURE PRIMER							
Standard: JOTACOTE UNIVERSAL (alu. red toned)	1	200	3.6	4 hrs	#	240	
Alternative: JOTAMASTIC 80 (alu. red toned)	1	200	4.0	10 hrs	#	145	
Repair Kit (1:1 mix): JOTAMASTIC SMART PACK (red)	2	70	10.7	7 hrs	#	230	
J. ABOVE WATER HULL & SUPERSTRUCTURE FINISH BS381C 676							
Polysiloxane: HARDTOP OPTIMA	1	75	10.1	4 hrs	#	215	
Cured Acrylic: HARDTOP CA	1	75	8	5 hrs	#	340	

ANNEX D
WHOLE SHIP SPECIFICATIONS
Proposed by

JOTUN COATINGS (EUROPE) LTD

Proposed Systems /Materials	Number of Coats	NDFT per coat microns	Theo SR m ²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per litre	NATO Stock Number
K. FLIGHT & WEATHERDECK SYSTEMS – DEF STAN 80-134							
(a) Hanger Doors							
[Factory finished - Interpon 610 – see International Paints WSS]							
(b) Flight & Weatherdeck - Type 2 Non-skid Finish (coarse)							
Primer: JOTAMASTIC 87 (grey)	1	150	5.5	10 hrs	#	150	
Finish: JOTA ARMOUR (BS381C 640)	2	375	2.4	14 hrs	#	70	
Type 2 Repair Kit: JOTA ARMOUR REPAIR KIT (640)	1	750	1.2	1.2	#	70	
(c) Hangar & weatherdeck - Type 1 Non-Skid Finish (fine)							
Primer: JOTAMASTIC 87 (grey)	1	150	5.5	10 hrs	#	150	
Finish: JOTA ARMOUR FINE (BS381C 632 or 640)	2	200	4.5	14 hrs	#	70	
Type 1 Repair Kit: JOTA ARMOUR FINE REPAIR KIT (632 or 640)	1	400	2.2	14 hrs	#	70	
(d) GLOSS FOR DECK MARGINS							
Cured acrylic: HARDTOP CA (BS381C 676)	1	75	8	5 hrs	#	340	
Polysiloxane: HARDTOP OPTIMA (BS381C 676)	1	75	10.1	4 hrs	#	215	
L & M. INTERIOR DRY SPACES							
Standard Primer: WATERFINE ACRYLIC PRIMER (white)	1	80	5.8	1 hrs	#	66	
Alternative Primer(2 pack): WATERFINE PRIMER (white)	1	80	5.8	1.5 hrs	#	60	99-462-9708
Finish: TBC							
N & O. INTERIOR WET SPACES INC. MAGAZINE & CITADEL LOBBY							
Primer: WATERFINE PRIMER (white)	1	100	4.6	1.5 hrs	#	60	99-462-9708
Finish: WATERFINE PRIMER (BS4800 00A01) (BS381C 676)	1 or 2	40	11.6	1.5 hrs	#	60	
Cleansing Stations - Primer: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
(Maker Coatings) Finish: AMERON PSX 700 White	1	125	7.2	4.5 hrs	#	120	17-113-5689
P. INTERIOR DECKS							
Primer: WATERFINE PRIMER (white)	1	100	4.6	1.5 hrs	#	60	99-462-9708
Finish: WATERFINE PRIMER (BS4800 14C39)	1 or 2	40	11.6	1.5 hrs	#	60	
Cleansing Stations - Primer: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
(Maker Coatings) Finish: AMERON PSX 700 BS4800 14C39	2	125	7.2	4.5 hrs	#	120	17-113-6169
Q. BATTERY COMPARTMENTS							
Primer: WATERFINE PRIMER (white)	1	100	4.6	1.5 hrs	#	60	99-462-9708
Finish: WATERFINE PRIMER (BS4800 00A01)	1 or 2	40	11.6	1.5 hrs	#	60	

ANNEX D
WHOLE SHIP SPECIFICATIONS
Proposed by

JOTUN COATINGS (EUROPE) LTD

Proposed Systems /Materials	Number of Coats	NDFT per coat microns	Theo SR m ²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per litre	NATO Stock Number
R. CABLE LOCKERS & COFFERDAMS							
Standard: JOTAMASTIC 80 (alu. red toned)	1	175	4.6	10 hrs	#	145	
Alternative: JOTACOTE UNIVERSAL (alu. red toned)	1	200	3.6	4 hrs	#	240	
S. BLACK/GREY & WATER BALLAST TANKS IMO PSPC							
Water Ballast Tanks							
Standard: BALLOXY HB LIGHT (green)	1	160	5.1	10 hrs	#	150	
BALLOXY HB LIGHT (beige or grey)	1	160	5.1	10 hrs	#	150	
Alternative: JOTACOTE UNIVERSAL (alu. red toned)	1	160	4.5	4 hrs	#	240	
JOTACOTE UNIVERSAL (grey)	1	160	4.5	4 hrs	#	240	
Black & Grey Water Tanks							
Standard: TANKGUARD STORAGE (light red)	1	150	4.2	10 hrs	30 days	310	
TANKGUARD STORAGE (red)	1	150	4.2	10 hrs	30 days	310	
Alternative: TANKGUARD DW (light grey)	1	150	6.7	12 hrs	5 days	2	
TANKGUARD DW (white)	1	150	6.7	12 hrs	5 days	2	
T. MACHINERY SPACE BILGES							
Primer: JOTACOTE UNIVERSAL (alu. red toned)	1	125	5.8	4 hrs	#	240	
Finish: HARDTOP CA (BS4800 00A01)	1 or 2	75	10.1	4 hrs	#	215	
U. AVCAT, DIESO, LUB &HYDRAULIC OIL TANKS SYSTEM DEF STAN 80-97 (HIGH SOLIDS)							
TANKGUARD STORAGE (light red)	1	125	5.0	10 hrs	30 days	310	
TANKGUARD STORAGE (light grey)	1	125	5.0	10 hrs	30 days	310	
V. POTABLE WATER TANKS							
TANKGUARD DW (light grey)	1	150	6.7	12 hrs	5 days	2	
TANKGUARD DW (white)	1	150	6.7	12 hrs	5 days	2	
W. AQUEOUS FILM-FORMING FOAM (AFFF) TANKS							
TANKGUARD DW (light grey)	1	150	6.7	12 hrs	5 days	2	
TANKGUARD DW (white)	1	150	6.7	12 hrs	5 days	2	
X. DEMINERALISED WATER TANKS (Max Temperature 90 °C)							
Standard: TANKGUARD STORAGE (light grey)	1	125	5.0	10 hrs	30 days	310	
TANKGUARD STORAGE (light red)	1	125	5.0	10 hrs	30 days	310	
TANKGUARD STORAGE (light grey)	1	125	5.0	10 hrs	30 days	310	
Alternative: TANKGUARD PLUS (white)	1	100	7.0	20 hrs	21 days	300	
TANKGUARD PLUS (buff)	1	100	7.0	20 hrs	21 days	300	
TANKGUARD PLUS (white)	1	100	7.0	20 hrs	21 days	300	

ANNEX D
WHOLE SHIP SPECIFICATIONS
Proposed by

JOTUN COATINGS (EUROPE) LTD

Proposed Systems /Materials	Number of Coats	NDFT per coat microns	Theo SR m ²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per litre	NATO Stock Number
Y. EPOXY HOLDING PRIMER							
MUKI EPS (red)	1	20	12.5	7 hrs		610	
Z. PRIMERS FOR NON-FERROUS METALS & FRP							
Aluminium, Stainless steel, Zinc Spray or Galvanised surfaces:							
WATERFINE PRIMER (white)	1	60	7.6	1.5 hrs	#	60	99-462-9708
FRP Indicator Coat: PENGUARD HB (White)	2	150	3.6	8 hrs	#	390	

NOTES:-

1. The recoat intervals published above are based on the Manufacturer's figures quoted for 23°C
2. The number of coats stated in the above table, relate to airless spray application to achieve the stated Nominal Dry Film Thickness (NDFT). Should brush application be required for touch up and repair then additional coats may be necessary to achieve the required NDFT.
3. # = See Manufacturer's Technical Data Sheet / Application instructions for requirements.
4. It is important to ensure that surfaces are clean and free of contamination when overcoating materials, that have been left exposed, this is especially true for those products with an indefinite recoat interval.
5. The Theoretical Spreading Rate (Theo SR) quoted in the table above, per coat, is calculated from the coatings physical constants and makes no allowance for loss and assumes a totally smooth surface. The actual spreading rate achieved (Practical SR) is dependent upon many factors and in practice the factor used may vary from as little as 1.05 up to as much as 4+. It is usual for Paint Manufacturers to use figures of 1.3 or 1.4 for estimating purposes but they always add the caveat that actual consumption achieved may vary due to such factors as surface profile, wastage due to material left in the can, weather conditions, skill of operator etc.
6. **~** = Use blast primer **Y.** when appropriate

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ANNEX E
WHOLE SHIP SPECIFICATION
Proposed by

MAKER COATING SYSTEMS LTD.
Incorporating: PPG, Ameron, Sigma & CORROLESS

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
A & B. BELOW WATER HULL PRIMER ~							
Standard: SIGMASHIELD 220 7922	1	125	6.4	3½ hrs	14 days	262	99-403-5015
Alternative: SIGMASHIELD 420 7951	1	150	5.6	3½ hrs	14 days	239	99-723-3658
Tie-Coat (if req'd): SIGMACOVER 525 7902	1	100	6.1	12 hrs	14 days	365	
C. ANTIFOULING (Self Polishing – SPC 5yr life)							
SIGMA ECOFLEET 530 (red brown) 7385	1	110	5.4	6 hrs	#	339	
SIGMA ECOFLEET 530 (brown) 7385	1	110	5.4	6 hrs	#	339	
D. ANTIFOULING SYSTEM (Foul Release - FRC 5yr + life)							
SIGMACOVER 295 7947	1	100	5.5	16 hrs	10 days	436	
SIGMASHIELD 610 7978	1	150	3.8	12 hrs	5 days	436	
SIGMAGLIDE 790 7386	1	150	5.3	12 hrs	5 days	187	
SIGMAGLIDE 890: Silicone FR Finish 7399	1	150	3.4	20 mins	#	215	
SIGMAGLIDE 990: High Efficiency FR Finish 7397	1	180	4.4	2 hrs	#	248	
E. ANTIFOULING FINISH (SPC 3yr + life)							
SIGMA ECOFLEET 530 (red brown) 7385	1	110	5.4	6 hrs	#	339	
SIGMA ECOFLEET 530 (brown) 7385	1	110	5.4	6 hrs	#	339	
F. BOOTTOP ANTIFOULING FINISH (SPC)							
SIGMA ECOFLEET 530 (black) 7385	1	110	5.4	6 hrs	#	339	
G & H. A/W HULL & SUPERSTRUCTURE PRIMER							
Standard: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
Alternative: SIGMASHIELD 220 7922	1	125	6.4	3½ hrs	14 days	262	99-403-5015
J. A/W HULL& SUPERSTRUCTURE FINISH Lt Weatherwork Grey							
Polysiloxane: AMERON PSX700	1	75	12	3 hrs	#	164	
Epoxy Acrylic: SIGMADUR 540 7740	1	50	10.8	8 hrs	#	411	

ANNEX E
WHOLE SHIP SPECIFICATION
Proposed by

MAKER COATING SYSTEMS LTD.
Incorporating: PPG, Ameron, Sigma & CORROLESS

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
K. FLIGHT & WEATHERDECK SYSTEMS - DEFSTAN 80-134							
(a) Hangar Doors							
[Factory finished - Interpon 610 – see International Paints WSS]							
(b) Flight & Weatherdeck - Type 2 Non-skid Finish (coarse)							
Primer: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
Finish: AMERLOCK 400 NS Extra Dark Sea Grey BS381C 640	2	400	2.3	16 hrs	#	106	99-940-6452
Type 2 Repair Kit: AMERLOCK 400 NS T2R							
(c) Hanger & Weatherdeck - Type 1 Non-skid Finish (fine)							
Primer: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
Hangar Deck: AMERLOCK 400 NS Dark Admiralty Grey BS 381C 632	2	300	4	16 hrs	#	106	
Weatherdeck: AMERLOCK 400 NS Extra Dark Sea Grey BS 381C 640	2	300	4	16 hrs	#	106	99-940-6452
Type 1 Repair Kit: AMERLOCK 400 NS T1R							
(d) Gloss for Deck Margins: AMERLOCK 400C BS 381C 640	1	125	7	16 hrs	#	106	
L & M. INTERIOR DRY COMPARTMENTS							
Primer: AMERLOCK 400C	1	100	7	16 hrs	#	106	99-974-7400
Finish: AMERLOCK 400C BS4800 00A01	1	100	7	16 hrs	#	106	99-958-6062
Alternative Primer: SIGMA AQUACOVER 25 7150	1	75	5.7	4 hrs	#	25	
Finish: SIGMA AQUACOVER 45 7250	1	50	6.8	24 hrs	#	10	99-236-5744
N & O. INTERIOR WET COMPARTMENTS BS4800 00A01							
Primer: AMERLOCK 400C	1	100	7	16 hrs	#	106	99-974-7400
Standard Finish: AMERLOCK 400C	1	100	7	16 hrs	#	106	99-958-6062
Citadel Lobby Finish: AMERLOCK 400C or Grey BS381C 676	1	100	7	16 hrs	#	106	99-958-6062
Magazines Finish: AMERLOCK 400C	1	100	7	16 hrs	#	106	99-958-6062
Cleansing Stations Primer: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
Finish: AMERON PSX 700	1	125	7.2	4.5 hrs	#	120	17-113-5689
P. INTERIOR DECKS BS4800 14C39							
Primer: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
Finish: AMERCOAT 300A	1	50	10.4	16 hrs	#	0	17-113-5690
Cleansing Stations Finish: AMERON PSX 700	1	125	7.2	4.5 hrs	#	120	17-113-6169

ANNEX E
WHOLE SHIP SPECIFICATION
Proposed by

MAKER COATING SYSTEMS LTD.
Incorporating: PPG, Ameron, Sigma & CORROLESS

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Q. BATTERY COMPARTMENTS BS4800 00A01							
Primer: AMERLOCK 400C	1	100	7	16 hrs	#	106	99-974-7400
Finish: AMERLOCK 400C	1	100	7	16 hrs	#	106	99-958-6062
R. CABLE LOCKERS & COFFERDAMS							
SIGMAGUARD CSF 650 7443	1	350	2.9	24 hrs	20 days	143	
S. BLACK, GREY & SEAWATER BALLAST TANKS							
CORROLESS EPF Black or Buff	1	200	4.8	16 hrs	#	80	25-150-0972
CORROLESS RF35 Grey	1	200	4.8	16 hrs		93	99-337-0778
T. MACHINERY SPACE BILGES							
AMERLOCK 400C WHITE	2	125	7	16 hrs	#	106	17-108-8248
U. AVCAT, DIESO, LUB & HYDRAULIC OIL TANKS SYSTEM DEF-STAN 80-97 (HIGH SOLIDS)							
CORROLESS EPF Black or Buff	1	200	4.8	16 hrs	3 days	80	25-150-0972
CORROLESS RF35 White	1	200	4.8	16 hrs	3 days	93	25-150-0973
V. POTABLE WATER TANKS							
CORROLESS EPF Black or Buff	1	200	4.8	16 hrs	3 days	80	25-150-0972
CORROLESS RF35 Grey	1	200	4.8	16 hrs	3 days	93	99-337-0778
W. AQUEOUS FOAM FORMING FLUID (AFFF) TANKS							
Standard: CORROLESS EPF Black or Buff	1	200	4.8	16 hrs	3 days	80	25-150-0972
CORROLESS RF35 Grey	1	200	4.8	16 hrs	3 days	93	99-337-0778
Alternative: SIGMAGUARD CSF 650 7443	1	350	2.9	24 hrs	20 days	143	
X. DEMINERALISED WATER TANKS (Max Temperature 60°C)							
Standard: CORROLESS EPF Black or Buff	1	200	4.8	16 hrs	3 days	80	25-150-0972
CORROLESS RF35 Grey	1	200	4.8	16 hrs	3 days	93	99-337-0778
Alternative: SIGMAGUARD CSF 650 7443	1	350	2.9	24 hrs	20 days	143	
Y. EPOXY HOLDING PRIMER							
SIGMACOVER 280 7417	1	50	11.4	8 hrs	6 months	432	99-569-7697

ANNEX E
WHOLE SHIP SPECIFICATION
Proposed by

MAKER COATING SYSTEMS LTD.
Incorporating: PPG, Ameron, Sigma & CORROLESS

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Z. PRIMERS FOR NON-FERROUS METALS & FRP							
Stainless Steel: SIGMACOVER 280	1	50	11.4	8 hrs	#	432	
Aluminium / Zinc Spray / Galvanise: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
FRP Indicator coat: AMERLOCK 400C Green RAL 6011	2	125	7	16 hrs	#	106	17-120-4829

Notes:

1. The recoat intervals published above are based on the manufacturer's figures quoted for 20°C
2. The number of coats stated in the above table, relate to airless spray application to achieve the stated Nominal Dry Film Thickness (NDFT). Should brush application be required for touch up and repair then additional coats may be necessary to achieve the required NDFT.
3. **#** = No maximum recoat interval, see Manufacturer's Technical Data Sheet/Application Instructions for requirements.
4. It is important to ensure that surfaces are clean and free of contamination when overcoating materials, that have been left exposed, this is especially true for those products with an indefinite recoat interval.
5. The Theoretical Spreading Rate (TSR) quoted in the table above is calculated from the coatings physical constants and makes no allowance for loss and assumes a totally smooth surface. The actual spreading rate achieved Practical Spreading Rate (PSR) is dependent upon many factors and in practice the factor used may vary from as little as 1.05 up to as much as 4+. It is usual for paint manufactures to use figures of 1.3 or 1.4 for estimating purposes but they always add the caveat that actual consumption achieved may vary due to such factors as surface profile, wastage due to material left in the can, weather conditions, skill of operator etc.
6. **~** = Use blast primer **Y.** when appropriate

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ANNEX F
WHOLE SHIP SPECIFICATIONS
Proposed by

PPG Protective & Marine Coatings

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
A & B. BELOW WATER HULL PRIMER ~							
Standard: SIGMASHIELD 240 7991	1	175	5	5hrs	30 days	153	
Tie Coat (for C, E & F if req'd): SIGMACOVER 525 7902	1	75	8.2	12 hrs	14 days	365	
C. ANTIFOULING FINISH (Self Polishing - SPC 5yr life)							
SIGMA ECOFLEET 530 (red brown) 7385	1	175	3.4	6 hrs	#	339	
SIGMA ECOFLEET 530 (brown) 7385	1	175	3.4	6 hrs	#	339	
D. ANTIFOULING SYSTEM (Foul Release - FRC 5yr + life)							
SIGMASHIELD 240 7991	1	125	7	5hrs	30 days	153	
SIGMASHIELD 610 7978	1	150	3.8	12 hrs	5 days	437	
SIGMAGLIDE 790 7386	1	150	5.3	12 hrs	5 days	187	
SIGMAGLIDE 890: Silicone FR Finish 7399	1	150	3.4	20 mins	#	215	
SIGMAGLIDE 990: High Efficiency FR Finish 7397	1	180	4.4	2 hrs	#	248	
SIGMAGLIDE 1290: Low-speed Slime Release Finish	1	180	4.8	#	#	118	
Seek approval. Operational req'ment req'd due to additional H&S risks.							
E. ANTIFOULING (SPC 3yr life)							
SIGMA ECOFLEET 530 (red brown) 7385	1	110	5.4	6 hrs	#	339	
SIGMA ECOFLEET 530 (brown) 7385	1	110	5.4	6 hrs	#	339	
F. BOOTTOP ANTIFOULING (SPC)							
SIGMA ECOFLEET 530 (black) 7385	1	110	5.4	6 hrs	#	339	
G & H. ABOVE WATER HULL & SUPERSTRUCTURE PRIMER							
Standard: SIGMASHIELD 240 7991	1	150	5.8	5hrs	30 days	153	
Alternative: SIGMASHIELD 220 7922	1	150	5.3	3½ hrs	14 days	262	99-403-5015
J. ABOVE WATER HULL & SUPERSTRUCTURE FINISH BS 381C 676 Light Weatherwork Grey							
Polysiloxane: SIGMA PSX700 7777	1	75	12	3 hrs	#	164	
Epoxy Acrylic: SIGMADUR 540 7740	1	50	10.8	8 hrs	#	411	
Urethane Polyester: SIGMADUR ONE 7533	1	50	10.6	8 hrs	#	400	

ANNEX F
WHOLE SHIP SPECIFICATIONS
Proposed by

PPG Protective & Marine Coatings

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
K. FLIGHT & WEATHERDECK SYSTEMS – DEF STAN 80-134							
(a) Hangar Doors							
[Factory finished - Interpon 610 – see International Paints WSS]							
(b) Flight Deck - Type 2 Non-skid Finish							
Primer: AMERCOAT 137	1	125	3.9	12 hrs	3 days	264	
Finish: AMERCOAT 138L Extra Dark Sea Grey BS 381C 640	1	1300	0.6	24 hrs	#	168	1 coat?
Type 2 Repair Kit:							
(c) Hanger Deck & Weatherdeck - Type 1 Non-Skid Finish							
Primer: AMERCOAT 137 DECK PRIMER	1	125	3.9	12 hrs	3 days	264	
Hangar Deck: AMERCOAT 138G Dark Admiralty Grey BS 381C 632	1	1300	0.6	24 hrs	#	168	1 coat?
Weatherdeck: AMERCOAT 138G Extra Dark Sea Grey BS 381C 640	1	1300	0.6	24 hrs	#	168	1 coat?
Type 1 Repair Kit:							
(d) Gloss for Deck Margins: SIGMADUR 540	1	50	12	8 hrs	#	411	
L & M. INTERIOR DRY SPACES BS 4800 00A01							
Standard Primer: SIGMA AQUACOVER 25 7150	1	75	6.6	4 hrs	#	31	99-321-6318
Finish: SIGMA AQUACOVER 45 7250	1	50	6.8	6 hrs	#	17	99-277-8693
Alternative Primer: SIGMACOVER 240 7991	1	75	11.6	5 hrs	30 days	153	
Finish: SIGMACOVER 240 7991	1	75	11.6	5 hrs	30 days	153	
N & O. INTERIOR WET SPACES BS 4800 00A01							
Standard Areas Primer: SIGMACOVER 240 7991	1	100	8.7	5 hrs	30 days	153	
Finish: SIGMACOVER 240 7991	1	100	8.7	5 hrs	30 days	153	
Citadel Lobby Primer: SIGMACOVER 240 7991	1	75	11.6	5 hrs	30 days	153	
& Magazine Finish: SIGMASHIELD 420 7951	1	150	5.6	3½ hrs	14 days	212	99-549-3974
or Grey BS 381C 676							
Cleansing Stations: SIGMAGUARD CSF 650 7443	1	350	2.9	24 hrs	20 days	143	
P. INTERIOR DECKS BS 4800 Green 14C39							
Standard & Cleansing Stations							
Primer: SIGMACOVER 240 7991	1	100	8.7	5 hrs	30 days	153	
Finish: SIGMACOVER 400 7988	1	100	8.5	16 hrs	30 days	180	

ANNEX F
WHOLE SHIP SPECIFICATIONS
Proposed by

PPG Protective & Marine Coatings

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Q. BATTERY COMPARTMENTS BS4800 00A01							
Primer: SIGMACOVER 240 7991	1	100	8.7	5 hrs	30 days	153	
Finish: SIGMACOVER 400 7988	1	100	8.5	16 hrs	30 days	180	
R. CABLE LOCKERS & COFFERDAMS							
SIGMACOVER 240 7991	1	150	5.8	5 hrs	30 days	153	
S. BLACK, GREY & SEAWATER BALLAST TANKS IMO PSPC							
Water Ballast Tanks: SIGMACOVER 240 7991	2	160	5.4	5 hrs	30 days	153	
Black / Grey Water Tanks: SIGMAGUARD CSF650 7443	1	350	2.9	24 hrs	20 days	143	
T. MACHINERY SPACE BILGES							
SIGMACOVER 240 7991	1	175	5	5 hrs	30 days	153	
U. AVCAT, DIESO, LUB & HYDRAULIC OIL TANKS SYSTEM DEF STAN 80-97 (HIGH SOLIDS)							
SIGMAGUARD CSF 650 7443	1	350	2.9	24 hrs	20 days	143	
V. POTABLE WATER TANKS							
SIGMAGUARD CSF 585 7785	1	300	3.3	24 hrs	20 days	6	
W. AQUEOUS FILM-FORMING FOAM (AFFF) TANKS							
SIGMAGUARD CSF 650 7443	1	350	2.9	24 hrs	20 days	143	
X. DEMINERALISED WATER TANKS (Max Temperature **60**°C)							
SIGMAGUARD CSF 650 7443	1	350	2.9	24 hrs	20 days	143	
Y. REFIT / MAINTENANCE EPOXY HOLDING PRIMER							
SIGMACOVER 280 7417	1	50	11.4	8 hrs		430	99-569-7697

ANNEX F
WHOLE SHIP SPECIFICATIONS
Proposed by

PPG Protective & Marine Coatings

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Z. PRIMERS FOR NON-FERROUS METALS & FRP							
Aluminium / Stainless Steel / Zinc Spray / Galvanise:							
SIGMACOVER 280 7417	1	50	11.4	8 hrs	3 months	432	99-569-7697
FRP Indicator coat: AMERLOCK 400C Green RAL 6011	2	125	7	16 hrs	#	106	17-120-4829

Notes:

1. The recoat intervals published above are based on the manufacturer's figures quoted for 20°C

2. The number of coats, stated in the above table, relate to airless spray application to achieve the stated Nominal Dry Film Thickness (NDT). Should brush application be required for touch up and repair then additional coats may be necessary to achieve the required NDFT.

3. # = No maximum recoat interval, see Manufacturer's Technical Data Sheet/Application Instructions for requirements.

4. It is important to ensure that surfaces are clean and free of contamination when overcoating materials, that have been left exposed, this is especially true for those products with an indefinite recoat interval.

5. The Theoretical Spreading Rate (TSR) quoted in the table above is calculated from the coatings physical constants and makes no allowance for loss and assumes a totally smooth surface. The actual spreading rate achieved Practical Spreading Rate (PSR) is dependent upon many factors and in practice the factor used may vary from as little as 1.05 up to as much as 4+. It is usual for paint manufactures to use figures of 1.3 or 1.4 for estimating purposes but they always add the caveat that actual consumption achieved may vary due to such factors as surface profile, wastage due to material left in the can, weather conditions, skill of operator etc.

6. **~** = Use blast primer **Y.** when appropriate

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ANNEX G
WHOLE SHIP SPECIFICATIONS
Proposed by

SHERWIN WILLIAMS Protective & Marine Coatings

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
A & B. BELOW WATER HULL PRIMER ~							
~~EPIGRIP~~ Macropoxy® C425V2	1	175	4.3	8 hrs	#	186	99-786-7949
Tie Coat (if req'd): RESISTEX M535	1	50	8.0	2 hrs	#	502	99-453-1479
C. ANTIFOULING FINISH (Self Polishing - SPC 5yr life)							
TBC							
D. ANTIFOULING SYSTEM (Foul Release - FRC 5yr + life)							
TBC							
E. ANTIFOULING (SPC 3yr + life)							
ENVOY TF 500 Brown	1	75	8.4	6 hrs	#	390	
ENVOY TF 500 Red	1	75	8.4	6 hrs	#	390	
F. BOOTTOP ANTIFOULING (SPC)							
ENVOY TF 500 Black	2	75	8.4	6 hrs	#	390	99-423-7738
G & H. ABOVE WATER HULL & SUPERSTRUCTURE PRIMER ~							
~~EPIGRIP~~ Macropoxy® C425V2	1	100	7.5	4 hrs	#	186	99-786-7949
J. A/W HULL & SUPERSTRUCTURE FINISH BS 381C 676							
Silicone Alkyd: ~~Leighs~~ Steel Spec™ A165	1	35	14.6	16 hrs	#	407	99-982-2604
Acrylic Epoxy: ~~Leighs~~ Acrolon™ C750V2	1	50	10.6	3 hrs	#	364	99-212-2175
Tie Coat (if req'd): ~~Leighs~~ Steel Spec™ M671	1	35	14.9	4 hrs	#	380	99-872-1746
Sealer for RASH: (obsolete see Hempel WSS)							

ANNEX G
WHOLE SHIP SPECIFICATIONS
Proposed by

SHERWIN WILLIAMS Protective & Marine Coatings

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
K. FLIGHT & WEATHERDECK SYSTEMS – DEF STAN 80-134							
(a) Hangar Doors							
[Factory finished - Interpon 610 – see International Paints WSS]							
(b) Flight & Weatherdeck - Type 2 Non-skid Finish (Coarse) BS 381C							
Primer: ~~EPIGRIP~~ Macropoxy® C425V2	1	125	6.0	4 hrs	#	186	99-786-7949
Finish: EPIDEK M339 Extra Dark Sea Grey	2	200	1.8	4 hrs	#	250	99-215-4495
Type 2 Repair Kit: EPIDEK F339							99-383-4334
(c) Hanger & Weatherdeck - Type 1 Non-skid Finish (fine) BS 381C							
Primer: ~~EPIGRIP~~ Macropoxy® C425V2	1	125	6.0	4 hrs	#	186	99-786-7949
Hangar Deck: EPIDEK M377 Dark Admiralty Grey BS 381C 632	2	250	2.5	4 hrs	#	330	99-777-8689
Weatherdeck: EPIDEK M377	2	250	2.5	4 hrs	#	330	
Type 1 Repair Kit: EPIDEK F377							99-087-4902
(d). Gloss for Deck Margins: ~~EPIGRIP~~ Macropoxy® M262	1	75			#	354	99-133-8713
L & M. INTERIOR DRY COMPARTMENTS							
Primer: ~~EPIGRIP~~ Macropoxy® C425V2	1	125	6.0	5 hrs	#	186	99-786-7949
Finish: ~~ENVIROGARD~~ Sher-Cryl™ BS 4800 00A01	1	25	15.6	3 hrs	#	78	99-517-5228
N & O. INTERIOR WET COMPARTMENTS							
Primer: ~~EPIGRIP~~ Macropoxy® C425V2	1	125	6.0	5 hrs	#	186	99-786-7949
Standard Areas Finish: ~~BIOGARD~~ Macropoxy® M630V2 BS4800 00A01	1	75	6.8	24 hrs	#	0	99-535-5105
Citadel lobby Finish: ~~BIOGARD~~ Macropoxy® M630V2 - Colour either: BS 4800 00A01 or Grey BS 381C 676	1	75	6.8	24 hrs	#	66	99-535-5105
Cleansing Stations Finish: ~~EPIGRIP~~ Macropoxy® H766 White	1	40	14.0	5 hrs	#	395	99-623-9946
Magazine Finish: ~~BIOGARD~~ Macropoxy® M630V2 BS 4800 00A01	1	75	6.8	24 hrs	#	0	99-535-5105
P. INTERIOR DECKS Finish - Green BS 4800 14C39							
Standard Primer: ~~EPIGRIP~~ Macropoxy® C425V2	1	125	6.0	5 hrs	#	186	99-786-7949
Finish: ~~BIOGARD~~ Macropoxy® M630V2	1	75	6.8	24 hrs	#	0	99-255-5237
Cleansing Stations Finish: ~~EPIGRIP~~ Macropoxy® H766	1	40	14.0	5 hrs	#	395	99-501-4661

ANNEX G
WHOLE SHIP SPECIFICATIONS
Proposed by

SHERWIN WILLIAMS Protective & Marine Coatings

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Q. BATTERY COMPARTMENTS							
Primer: ~~EPIGRIP~~ Macropoxy® C425V2	1	100	7.5	4hrs	#	197	99-786-7949
Finish: ~~BIOGARD~~ Macropoxy® M630V2 BS 4800 00A01	1	75	6.8	24 hrs	#	0	99-535-5105
R. CABLE LOCKERS & COFFERDAMS							
~~EPIGRIP~~ Macropoxy® L524 WHITE	2	125	5.1	12 hrs	#	296	99-564-2934
S. BLACK/GREY & WATER BALLAST TANKS							
Water Ballast Tanks: ~~EPIGRIP~~ Macropoxy® L524 (typical dft 125. care req'd on overlap at 160)	2	160	3.9	12 hrs	#	296	99-564-2934
Black & Grey Water Tanks: ~~EPIGRIP~~ Macropoxy® C251	2	125	5.9	24 hrs	28 days	235	99-284-3464
T. MACHINERY SPACE BILGES BS 4800 00A01							
~~EPIGRIP~~ Macropoxy® L524	2	125	5.1	12 hrs	#	296	99-564-2934
Optional Hygiene Coat: ~~BIOGARD~~ Macropoxy® M630V2	1	75	6.8	12 hrs	#	0	99-535-5105
U. AVCAT, DIESO, LUB & HYDRAULIC OIL TANKS SYSTEM DEF STAN 80-97 (HIGH SOLIDS)							
~~EPIGRIP~~ Macropoxy® M922	2	200	5.4	4 hrs	14 days	143	99-834-8384
V. POTABLE WATER TANKS							
~~WATERLINE~~ Macropoxy® P300	1	500	2.0	6 hrs	36 hrs	0	
W. AQUEOUS FILM-FORMING FOAM (AFFF) TANKS							
~~EPIGRIP~~ Macropoxy® C251	2	125	5.9	24 hrs	28 days	235	99-284-3464
X. DEMINERALISED WATER TANKS (Max Temperature 90°C)							
~~EPIGRIP~~ Macropoxy® C251	2	125	5.9	24 hrs	28 days	235	99-284-3464
Y. EPOXY HOLDING PRIMER							
~~METAGARD~~ Macropoxy® L574	1	25	11.6	3 hrs	#	594	99-895-9894
Alternative & maintenance: ~~EPIGRIP~~ Macropoxy® M111	1	60	9.0	4 hrs	#	383	99-884-5957

ANNEX G
WHOLE SHIP SPECIFICATIONS
Proposed by

SHERWIN WILLIAMS Protective & Marine Coatings

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
Z. PRIMERS FOR NON-FERROUS METALS & FRP							
Aluminium / Galvanise / Stainless Steel:							
~~EPIGRIP~~ Macropoxy® L425	1	35	17.1	5 hrs	#	346	99-777-8688
Zinc Spray: ~~METAGARD~~ Macropoxy® L574	1	25	11.6	3 hrs	#	594	99-895-9894
FRP Indicator Coat: ~~EPIGRIP~~ Macropoxy® C425V2 Off white	2	150	5	4 hrs	#	186	99-133-8714

Notes:

1. The recoat intervals published above are based on the manufacturer's figures quoted for 23°C
2. The number of coats stated in the above table, relate to airless spray application to achieve the stated Nominal Dry Film Thickness (NDFT). Should brush application be required for touch up and repair then additional coats may be necessary to achieve the required NDFT.
3. # = Indefinite but see Manufacturer's Technical Data Sheet/Application Instructions for requirements.
4. It is important to ensure that surfaces are clean and free of contamination when overcoating materials, that have been left exposed, this is especially true for those products with an indefinite recoat interval.
5. The Theoretical Spreading Rate (TSR) quoted in the table above is calculated from the coatings physical constants and makes no allowance for loss and assumes a totally smooth surface. The actual spreading rate achieved Practical Spreading Rate (PSR) is dependent upon many factors and in practice the factor used may vary from as little as 1.05 up to as much as 4+. It is usual for paint manufactures to use figures of 1.3 or 1.4 for estimating purposes but they always add the caveat that actual consumption achieved may vary due to such factors as surface profile, wastage due to material left in the can, weather conditions, skill of operator etc.
6. **~** = Use blast primer **Y.** when appropriate.

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ANNEX H
WHOLE SHIP STOCK NUMBERS (NSNs)

1. WHOLE SHIP MATERIALS

Material	Supplier	Pack size	NSN
REMOVALL 520	Cirrus Systems Ltd		
ALP 500	Chugoku Paints (UK) Ltd	5 litres	8010-99-967-8636
AQUALIFE GLOSS FINISH Ash Grey BS4800 00A01	Chugoku Paints (UK) Ltd	5 litres	8010-99-757-9334
AQUALIFE GLOSS FINISH BS381C 676 Light Weatherwork Grey	Chugoku Paints (UK) Ltd	5 litres	8010-99-375-9367
AQUALIFE GLOSS FINISH Green BS4800 14C39	Chugoku Paints (UK) Ltd	5 litres	8010-99-755-6242
AQUALIFE GLOSS FINISH White	Chugoku Paints (UK) Ltd	5 litres	8010-99-371-8400
AQUALIFE WSE PRIMER Grey	Chugoku Paints (UK) Ltd	5 litres	8010-99-398-1182
CAMACRYL FINISH MAC Ash Grey BS4800 00A01	Chugoku Paints (UK) Ltd	5 litres	8010-99-676-4126
CAMACRYL FINISH MAC Azure Blue BS381C 104	Chugoku Paints (UK) Ltd	5 litres	8010-99-366-5444
CAMACRYL FINISH MAC Canary BS381C 309	Chugoku Paints (UK) Ltd	5 litres	8010-99-446-0554
CAMACRYL FINISH MAC Dark Blue BS4800 18C39	Chugoku Paints (UK) Ltd	5 litres	8010-99-862-0034
CAMACRYL FINISH MAC Mid Brunswick Green BS381C 226	Chugoku Paints (UK) Ltd	5 litres	8010-99-794-2129
CAMACRYL FINISH MAC Wedgwood Blue BS4800 18D43	Chugoku Paints (UK) Ltd	5 litres	8010-99-665-3660
CAMACRYL FINISH MAC White	Chugoku Paints (UK) Ltd	5 litres	8010-99-380-7010
CAMSIL WB Black	Chugoku Paints (UK) Ltd	5 litres	8010-99-397-4388
CAMSIL WB GREY 541W 0224 Lt Weatherwork Grey BS381C 676	Chugoku Paints (UK) Ltd	5 litres	8010-99-327-9058
CAMSIL WB Lt Brunswick Green BS381C 225	Chugoku Paints (UK) Ltd	5 litres	8010-99-250-1029
CAMSIL WB Signal Red BS381C 537	Chugoku Paints (UK) Ltd	5 litres	8010-99-225-7163
GALVANITE 200 White	Chugoku Paints (UK) Ltd	5 litres	8010-99-995-4247
GALVANITE 200 White	Chugoku Paints (UK) Ltd	20 litres	8010-99-290-5829
NZ PRIMER S Red Oxide	Chugoku Paints (UK) Ltd	20 litres	8010-99-595-6056
UMEGUARD HS Grey	Chugoku Paints (UK) Ltd	5 litres	8010-99-126-9478
UMEGUARD HS White	Chugoku Paints (UK) Ltd	5 litres	8010-99-564-2409
HIGH PROTECT 35651 Cream	Hempel Paints Limited	2½litres	8010-99-517-4318
HEMPADUR 15550 Off White 11630	Hempel Paints Limited	5 litres	8010-99-870-0653
HEMPADUR 15550 Off White 11630	Hempel Paints Limited	20 litres	8010-99-700-4191
HEMPADUR 15570 Light Grey 12430	Hempel Paints Limited	5 litres	8010-99-943-1152

ANNEX H
WHOLE SHIP STOCK NUMBERS (NSNs)

Material	Supplier	Pack size	NSN
HEMPADUR 15570 Light Grey 12430	Hempel Paints Limited	20 litres	8010-99-170-5097
HEMPADUR 45143 White 10000	Hempel Paints Limited	5 litres	8010-99-602-7280
HEMPADUR 45143 Red 50630	Hempel Paints Limited	5 litres	8010-99-535-5832
HEMPADUR 45880 White	Hempel Paints Limited	5 litres	8010-99-264-0387
HEMPADUR 45880 MIO 12430	Hempel Paints Limited	5 litres	8010-99-803-7233
HEMPADUR 45880 MIO 12430	Hempel Paints Limited	20 litres	8010-99-479-5449
HEMPADUR 45143 GREEN BS4800 14C39	Hempel Paints Limited	5 litres	8010-99-471-1920
HEMPEL'S NON SKID (NO AGGREGATE) 45143 BS381C 640 (Extra dark sea grey)	Hempel Paints Limited	5 litres	8010-99-879-5150
HEMPEL'S NON SKID 45710 BS381C 640 (Extra dark sea grey) Type 2	Hempel Paints Limited	20 litres	8010-99-831-0343
HEMPEL'S NON SKID 45340 BS381C 640 (Extra dark sea grey) Type 1	Hempel Paints Limited	20 litres	8010-99-213-1121
HEMPELS NON SKID 45710 BLACK 19990	Hempel Paints Limited	20 Kg	8010-99-507-2851
HEMPELS DECK MARKING 453GB Black	Hempel Paints Limited	20 litres	8010-99-480-7979
HEMPELS ANTIFOULING OLYMPIC 8695 Black	Hempel Paints Limited	20 litres	8010-99-147-9828
HEMPELS UNDERCOAT 42460 Grey	Hempel Paints Limited	2½ litres	8010-99-244-6752
HEMPELS SILICONE ALKYD FINISH 536GB Light Weatherwork Grey BS381C 676	Hempel Paints Limited	2½ litres	8010-99-772-5448
HEMPELS DECK MARKING 453GB White	Hempel Paints Limited	5 litres	8010-99-323-1118
HEMPELS DECK MARKING 453GB Green BS381C 225	Hempel Paints Limited	5 litres	8010-99-986-6762
HEMPELS DECK MARKING 453GB Red BS381C 537	Hempel Paints Limited	5 litres	8010-99-724-9085
HEMPELS DECK MARKING 453GB Black	Hempel Paints Limited	5 litres	8010-99-351-4222
HEMPELS DECK REPAIR KIT 942GB Type 1	Hempel Paints Limited	Pack	8010-99-471-2960
HEMPELS DECK REPAIR KIT 941GB Type 2	Hempel Paints Limited	Pack	8010-99-340-2100
HEMPELS NON SKID 45340 Grey BS3813 632 Type 1	Hempel Paints Limited	20 litres	8010-99-670-9581
HEMPELS WATER BASED EPOXY 48582 Black	Hempel Paints Limited	5 Litres	8010-99-864-5046
HEMPELS WATER BASED EPOXY 48582 BS4800 00A01 (Ash Grey)	Hempel Paints Limited	5 litres	8010-99-988-2715
HEMPELS WATER BASED EPOXY 48582 BS4800 14C39 (Green)	Hempel Paints Limited	5 litres	8010-99-279-8221
HEMPELS WATER BASED EPOXY 48582 BS381C 676 (Light Weatherwork Grey)	Hempel Paints Limited	5 litres	8010-99-976-9118
HEMUCRYL ENAMEL 58100 Azure Blue BS381C 104	Hempel Paints Limited	5 litres	8010-99-382-4025
HEMUCRYL ENAMEL 58100 Black	Hempel Paints Limited	5 litres	8010-99-175-1334
HEMUCRYL ENAMEL 58100 Canary BS381C 309	Hempel Paints Limited	5 litres	8010-99-858-1263
HEMUCRYL ENAMEL 58100 Dark Blue BS4800 18C39	Hempel Paints Limited	5 litres	8010-99-290-5925
HEMUCRYL ENAMEL 58100 Lt Brunswick Green BS381C 225	Hempel Paints Limited	5 litres	8010-99-831-8959

ANNEX H
WHOLE SHIP STOCK NUMBERS (NSNs)

Material	Supplier	Pack size	NSN
HEMUCRYL ENAMEL 58100 Mid Brunswick Green BS381C 226	Hempel Paints Limited	5 litres	8010-99-162-2531
HEMUCRYL ENAMEL 58100 Signal Red BS381C 537	Hempel Paints Limited	5 litres	8010-99-250-8046
HEMUCRYL ENAMEL 58100 Wedgwood Blue BS4800 18D43	Hempel Paints Limited	5 litres	8010-99-317-6235
HEMUCRYL ENAMEL 58100 Ash Grey BS4800 00A01	Hempel Paints Limited	5 litres	8010-99-660-9288
HEMUCRYL ENAMEL 58100 Golden Brown BS381C 414	Hempel Paints Limited	5 litres	8010-99-562-6381
HEMUCRYL ENAMEL 58100 White	Hempel Paints Limited	5 litres	8010-99-299-0228
HEMUCRYL TI-COAT 18200 Red 50710	Hempel Paints Limited	5 litres	8010-99-199-2908
HEMUDUR 18500 Grey 12170	Hempel Paints Limited	20 litres	8010-99-867-8090
INTERCRYL 506 GREY WPA300	International Coatings Ltd	5 litres	8010-99-147-1269
INTERCRYL 507 Grey BS 4800 00A01	International Coatings Ltd	5 litres	8010-99-365-4243
INTERCRYL 700 Grey BS 4800 00A01	International Coatings Ltd	5 litres	8010-99-7998832
INTERCRYL 700 Azure Blue BS381C 104	International Coatings Ltd	5 litres	8010-99-551-3792
INTERCRYL 700 Golden Brown BS381C 414	International Coatings Ltd	5 litres	8010-99-314-8294
INTERCRYL 700 Mariner Blue BS4800 18C39	International Coatings Ltd	5 litres	8010-99-551-3791
INTERCRYL 700 Mid Brunswick Green BS381C 226	International Coatings Ltd	5 litres	8010-99-812-5614
INTERCRYL 700 Wedgewood Blue BS4800 18D43	International Coatings Ltd	5 litres	8010-99-248-4598
INTERCRYL 700 White QYZ028	International Coatings Ltd	5 litres	8010-99-979-7888
INTERCRYL 700 Yellow RAL 1018	International Coatings Ltd	5 litres	8010-99-774-1224
INTERFINE 629 HS Black	International Coatings Ltd	5 litres	8010-99-375-3200
INTERFINE 629 HS Signal Red BS 381C 537	International Coatings Ltd	5 litres	8010-99-535-9034
INTERFINE 629 HS Lt Brunswick Green BS 381C 225	International Coatings Ltd	5 litres	8010-99-957-7410
INTERFINE 629 Light Weatherwork Grey BS381C 676	International Coatings Ltd	5 litres	8010-99-664-5391
INTERFINE 878 Light Weatherwork Grey BS381C 676	International Coatings Ltd	5 litres	8010-99-274-4682
INTERFINE 878 Black	International Coatings Ltd	5 litres	8010-99-907-6683
INTERFINE 979 GREEN	International Coatings Ltd	5 litres	8010-99-729-7357
INTERFINE 979 WHITE	International Coatings Ltd	5 litres	8010-99-168-7337
INTERGARD 263 Tie Coat Light Grey	International Coatings Ltd	20 litres	8010-99-133-3854
INTERGARD 269 PROTECTIVE PRIMER	International Coatings Ltd	20 litres	8010-99-983-0743
INTERGARD1735 WB Dark Sea Grey BS381C 640	International Coatings Ltd	5 litres	8010-99-702-0607
INTERGARD 1735 WB Green BS4800 14C39	International Coatings Ltd	5 litres	8010-99-483-1994
INTERGARD 1735 WB Ash Grey BS4800 00A01	International Coatings Ltd	5 litres	8010-99-255-0527
INTERGARD 740 Dark Sea Grey BS381C 640	International Coatings Ltd	5 litres	8010-99-182-2627
INTERGARD 740 Black	International Coatings Ltd	5 litres	8010-99-488-7443

ANNEX H
WHOLE SHIP STOCK NUMBERS (NSNs)

Material	Supplier	Pack size	NSN
INTERGARD 740 Red	International Coatings Ltd	5 litres	8010-99-377-5457
INTERGARD 740 White	International Coatings Ltd	5 litres	8010-99-773-8674
INTERGARD 740 Green	International Coatings Ltd	5 litres	TBC
INTERGARD 740 Yellow	International Coatings Ltd	5 litres	TBC
INTERGARD 740 Black	International Coatings Ltd	20 litres	8010-99-285-3824
INTERGARD 840 Series Buff	International Coatings Ltd	20 litres	8010-99-909-6023
INTERGARD 840 White	International Coatings Ltd	5 litres	8010-99-279-8277
INTERGARD 5000 Ash Grey BS 4800 00A01	International Coatings Ltd	5 litres	8010-99-000-5256
INTERLAC 846 Light Weatherwork Grey BS381C 676	International Coatings Ltd	2½ litres	8010-99-700-8410
INTERSHEEN AQUACOAT Ash Grey BS4800 00A01	International Coatings Ltd	5 litres	8010-99-365-4243
INTERSHIELD 851 Black	International Coatings Ltd	10 litres	8010-99-371-6753
INTERSHIELD 851 Extra Dark Sea Grey BS381C 640	International Coatings Ltd	20 litres	8010-99-391-0953
INTERSHIELD 852 Black	International Coatings Ltd	5 litres	8010-99-250-1864
INTERSHIELD 852 White	International Coatings Ltd	5 litres	8010-99-968-9269
INTERSHIELD 852 Red	International Coatings Ltd	5 litres	8010-99-666-9269
INTERSHIELD 852 Green	International Coatings Ltd	5 litres	8010-99-871-6360
INTERSHIELD 852 Dark Admiralty Grey BS 381C 632	International Coatings Ltd	5 litres	8010-99-149-8996
INTERSHIELD 852 Extra Dark Sea Grey BS 381C 640	International Coatings Ltd	5 litres	8010-99-149-8996
INTERSLEEK RAPID Black	International Coatings Ltd	2.5 litre	8010-99-358-0224
INTERSPEED 340 Black	International Coatings Ltd	20 litres	8010-99-874-3193
INTERSPEED 642 Black	International Coatings Ltd	20 litres	8010-99-792-1990

ANNEX H
WHOLE SHIP STOCK NUMBERS (NSNs)

Material	Supplier	Pack size	NSN
VINYGUARD SILVERGREY	Jotun Paints (Europe) Limited	5 litres	8010-99-212-5888
JOTA-ARMOUR AS Extra Dark Sea Grey BS381C 640	Jotun Paints (Europe) Limited	20 litres	8010-99-226-7300
WATERFINE PRIMER Lt Grey	Jotun Paints (Europe) Limited	5 litres	8010-99-462-9708
WATERFINE TOPCOAT Azure Blue BS381C 104	Jotun Paints (Europe) Limited	5 litres	8010-99-186-9127
WATERFINE TOPCOAT Black	Jotun Paints (Europe) Limited	5 litres	8010-99-877-1641
WATERFINE TOPCOAT Dark Blue BS4800 18C39	Jotun Paints (Europe) Limited	5 litres	8010-99-347-9130
WATERFINE TOPCOAT Lt Brunswick Green BS381C 225	Jotun Paints (Europe) Limited	5 litres	8010-99-131-6457
WATERFINE TOPCOAT Lt Weatherwork Grey BS381C 676	Jotun Paints (Europe) Limited	5 litres	8010-99-989-6214
WATERFINE TOPCOAT Mid Brunswick Green BS381C 226	Jotun Paints (Europe) Limited	5 litres	8010-99-873-4271
WATERFINE TOPCOAT Signal Red BS381C 537	Jotun Paints (Europe) Limited	5 litres	8010-99-921-4654
WATERFINE TOPCOAT Wedgwood Blue BS4800 18D43	Jotun Paints (Europe) Limited	5 litres	8010-99-212-5714
WATERFINE TOPCOAT White	Jotun Paints (Europe) Limited	5 litres	8010-99-372-9140
WATERFINE TOPCOAT Golden Brown	Jotun Paints (Europe) Limited	5 litres	8010-99-997-4563
AMERCOAT 300A Black	Maker Coating Systems Ltd	5 litres	8010-17-115-8450
AMERCOAT 300A White	Maker Coating Systems Ltd	5 litres	8010-17-108-8249
AMERCOAT 300A BS4800 00A01	Maker Coating Systems Ltd	5 litres	8010-99-535-8577
AMERCOAT 5105 Light Grey	Maker Coating Systems Ltd	5 litres	8010-17-117-4697
AMERCOAT 300A BS4800 14C39 Green	Maker Coating Systems Ltd	5 litres	8010-17-113-5690
AMERON ABC #3 Black	Maker Coating Systems Ltd	20 litres	8010-17-113-7497
AMERON PSX 700 Green BS4800 14C39	Maker Coating Systems Ltd	5 litres	8010-17-113-6169
AMERON PSX 700 White	Maker Coating Systems Ltd	5 litres	8010-99-858-1159
AMERLOCK 400C White	Maker Coating Systems Ltd	5 litres	8010-17-108-8248
AMERLOCK 400C Ash Grey BS4800 00A01	Maker Coating Systems Ltd	5 litres	8010-99-958-6062
AMERLOCK 400C SAXE BLUE	Maker Coating Systems Ltd	5 litres	8010-17-117-6678
AMERLOCK 400C OXFORD BLUE	Maker Coating Systems Ltd	5 litres	8010-17-117-6677
AMERCOAT 65 THINNER	Maker Coating Systems Ltd	5 litres	8010-17-117-6680
AMERCOAT 911 THINNER	Maker Coating Systems Ltd	5 litres	8010-17-117-6681
NU-KLAD 114A FILLER	Maker Coating Systems Ltd	7.24 kg unit	8010-17-117-6679
SPC-203 (Sea To Sky) Paint Remover	Maker Coating Systems Ltd	5 litres	8010-20-003-3432
SIGMA EDGEGUARD 5428 White	Maker Coating Systems Ltd	5 litres	8010-99-495-3513
SIGMASHIELD 420 7951 Ash Grey BS4800 00A01	Maker Coating Systems Ltd	5 litres	8010-99-549-3974
SIGMASHIELD 420 7951 Light Weatherwork Grey BS381C 676	Maker Coating Systems Ltd	5 litres	8010-99-723-3658
SIGMAHIELD 220 7922 Light Green	Maker Coating Systems Ltd	5 litres	8010-99-403-5015
SIGMASHIELD 280 7417 Yellow	Maker Coating Systems Ltd	5 litres	8030-99-354-0443

ANNEX H
WHOLE SHIP STOCK NUMBERS (NSNs)

Material	Supplier	Pack size	NSN
SIGMACOVER 280 LT 7417 Yellow	Maker Coating Systems Ltd	20 litres	8010-99-569-7697
AQUACOVER 45 7250 Azure Blue BS381C 104	Maker Coating Systems Ltd	5 litres	8010-99-863-5457
AQUACOVER 45 7250 Ash Grey B4800 00A01	Maker Coating Systems Ltd	5 litres	8010-99-277-8693
AQUACOVER 45 7250 Black	Maker Coating Systems Ltd	5 litres	8010-99-500-7412
AQUACOVER 45 7250 Canary BS381C 309	Maker Coating Systems Ltd	5 litres	8010-99-182-2670
AQUACOVER 45 7250 Dark Blue BS4800 18C39	Maker Coating Systems Ltd	5 litres	8010-99-957-7697
AQUACOVER 45 7250 Lt Brunswick Green BS381C 225	Maker Coating Systems Ltd	5 litres	8010-99-338-4734
AQUACOVER 45 7250 Lt Weatherwork Grey B381C 676	Maker Coating Systems Ltd	5 litres	8010-99-236-5744
AQUACOVER 45 7250 Mid Brunswick Green BS381C 226	Maker Coating Systems Ltd	5 litres	8010-99-269-1301
AQUACOVER 45 7250 Signal Red BS381C 537	Maker Coating Systems Ltd	5 litres	8010-99-880-0100
AQUACOVER 45 7250 Wedgwood Blue BS4800 18D43	Maker Coating Systems Ltd	5 litres	8010-99-471-2071
AQUACOVER 45 7250 White	Maker Coating Systems Ltd	5 litres	8010-99-225-7360
AQUACOVER 25 7150 Buff	Maker Coating Systems Ltd	5 litres	8010-99-321-6318
SIGMA ALPHAGEN 20 Series Black 7384	Maker Coating Systems Ltd	20 litres	8010-99-280-8371
~~BIOGARD~~ Macropoxy® M630V2 Light Weatherwork Grey BS381C 676	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-131-6908
~~BIOGARD~~ Macropoxy® M630V2 Green BS4800 14C39	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-255-5237
~~BIOGARD~~ Macropoxy® M630V2 Ash Grey BS4800 00A01	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-535-5105
~~BIOGARD~~ Macropoxy® M630V2 Black	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-739-8402
~~BIOGARD~~ Macropoxy® ARD M630V2 White	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-313-4440
~~ENVIROGARD~~ Sher-Cryl™ M770 Ash Grey BS4800 00A01	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-517-5228
~~ENVIROGARD~~ Sher-Cryl™ M770 Black	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-768-1426
~~ENVIROGARD~~ Sher-Cryl™ M770 Azure Blue BS381C 104	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-878-8150
~~ENVIROGARD~~ Sher-Cryl™ M770 Canary BS381C 309	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-726-4136
~~ENVIROGARD~~ Sher-Cryl™ M770 Dark Blue BS4800 18C39	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-723-3650
~~ENVIROGARD~~ Sher-Cryl™ M770 Lt Brunswick Green BS381C 225	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-313-9445
~~ENVIROGARD~~ Sher-Cryl™ M770 Mid Brunswick Green BS381C 226	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-862-5170
~~ENVIROGARD~~ Sher-Cryl™ M770 Signal Red BS381C 537	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-225-7155
~~ENVIROGARD~~ Sher-Cryl™ M770 Light Weatherwork Grey BS381C 676	Sherwin-Williams Protective & Marine Coatings Paints	5 litres	8010-99-833-4765
~~ENVIROGARD~~ Sher-Cryl™ M770 Wedgwood Blue BS4800 18D43	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-723-3651
~~ENVIROGARD~~ Sher-Cryl™ M770 White	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-231-3852
ENVOY TF500 Black	Sherwin-Williams Protective & Marine Coatings	15 litres	8010-99-423-7738
EPIDEK M339NA	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-845-5203
~~EPIGRIP~~ Macropoxy® C425V2 Light Grey	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-786-7949

ANNEX H
WHOLE SHIP STOCK NUMBERS (NSNs)

Material	Supplier	Pack size	NSN
~~EPIGRIP~~ Macropoxy® C425V2 Light Grey	Sherwin-Williams Protective & Marine Coatings	20 litres	8010-99-126-6377
~~EPIGRIP~~ Macropoxy® C425V2 Off White	Sherwin-Williams Protective & Marine Coatings	20 litres	8010-99-133-8714
~~EPIGRIP~~ Macropoxy® H766 Green BS4800 14C39	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-501-4661
~~EPIGRIP~~ Macropoxy® H766 White	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-623-9946
~~EPIGRIP~~ Macropoxy® L425	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-777-8688
~~EPIGRIP~~ Macropoxy® L524 Aluminium	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-216-0021
~~EPIGRIP~~ Macropoxy® L524 White	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-564-2934
~~EPIGRIP~~ Macropoxy® M111 Red	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-884-5957
~~EPIGRIP~~ Macropoxy® M902 Aluminium	Sherwin-Williams Protective & Marine Coatings	2.5 litres	8010-99-421-0972
~~EPIGRIP~~ Macropoxy® C251 White	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-284-3464
~~Leighs~~ Steel Spec™ A165 Silicone Alkyd Light Weatherwork Grey BS381C 676	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-982-2604
~~Leighs~~ Steel Spec™ M255 BLACK	Sherwin-Williams Protective & Marine Coatings	20 litres	8010-99-417-8341
~~Leighs~~ Steel Spec™ M255 VANDYKE BROWN BS4800 08B29	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-905-0772
~~Leighs~~ Acrolon™ C750V2 Light Weatherwork Grey BS381C 676	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-212-2175
~~Leighs~~ Steel Spec™ M671 Medium Grey	Sherwin-Williams Protective & Marine Coatings	5 litres	8010-99-872-1746
~~Leighs~~ Steel Spec™ M671 Medium Grey	Sherwin-Williams Protective & Marine Coatings	20 litres	8010-99-862-7354

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ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S1. PRESSURE HULL & EXTERNAL SUPERSTRUCTURE PRIMER Untiled areas							
Chugoku Paints (UK) Ltd							
UMEGUARD SX HS Black	1	150	5.13	28 hrs	7 days	232	
Hempel Paints Ltd							
HEMPADUR 45880 MIO Black	2	175	4.6	8 hrs	30 days	198	99-149-2439
International Paint Ltd							
INTERGARD 5000	1	175	4.68	12 hrs	2 months	179	99-000-5256
Jotun Paints (Europe) Limited							
PRIMASTIC UNIVERSAL R/T (STD)	1	200	3.75	10 hrs	#	194	99-509-7172
Maker Coating Systems Ltd							
CORROLESS EPF	1	200	4.8	16 hrs	3 days	80	25-150-0972
PPG Protective & Marine Coatings							
SIGMASHIELD 240 7991	1	175	5	5 hrs	30 days	153	
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® M922M Mastic Aluminium	2	200	4.2	4hrs	#	146	99-495-3873
S2. ANTIFOULING SYSTEM(S) Black Finish							
FOUL RELEASE / DEFENCE (FRC / FD) Sonar Dome							
Chugoku Paints (UK) Ltd							
BIOCLEAN SG R	1	125	4.86	6 hrs	24 hrs	406	
BIOCLEAN R	1	100	6.5	20 hrs	#	278	
BIOCLEAN HB pure silicone finish	1	150	3.55		#	261	
Hempel Paints Ltd							
Primer: HEMPADUR 15570	2	125	4	8 hrs	30 days	414	
Tie coat: HEMPASIL NEXUS X-SEAL 27600	1	120	4.5	TBC	TBC	405	
HEMPAGUARD X7 89900 Hydrogel c/w Biocides	2	150	4.7	6 hrs	48hrs	262	
International Paint Ltd							
Primer: INTERSHIELD 300	2	125	4.8	7 hrs	14 days	313	
Tie coat: INTERSLEEK 737	1	100	6.5	4 hrs	7 days	325	
INTERSLEEK 1100SR Slime Release Fluoropolymer	1	150	4.8	24 hrs	#	248	
PPG Protective & Marine Coatings							
Mid coat: SIGMASHIELD 610 7978	1	150	3.8	12 hrs	5 days	437	
Tie coat: SIGMAGLIDE 790 7386	1	150	5.3	12 hrs	5 days	187	
SIGMAGLIDE 1290 Low-speed slime release Silicone	1	180	4.8	#	#	118	
SELF POLISHING (SPC)							
Hempel Paints Ltd							
OLYMPIC + 72950 Black	2	120	5.0	8 hrs	#	367	
International Paint Ltd							
INTERSPEED 6400 Black	2	90	6.7	6 hrs	3 months	358	
Sherwin-Williams Protective & Marine Coatings							
ENVOY TF500 Black	3	75	8.4	6 hrs	#	316	99-423-7738
PPG Protective & Marine Coatings							
SIGMA ECOFLEET 530 7385 Black	3	100	6.6	6 hrs	#	331	

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S3. PRESSURE HULL & EXTERNAL SUPERSTRUCTURE FINISH Untiled areas							
Hempel Paints Ltd							
HEMPADUR 47182 Black	1	125	6	9 hrs	5 days	364	
International Paint Ltd							
INTERGARD 5000 Black	1	125	6.56	12 hrs	2 months	179	
Sherwin-Williams Protective & Marine Coatings							
~~RESISTEX~~ Macropoxy® M535 Black	1	75	5.3	2	#	502	99-453-1479
Maker Coating Systems Ltd/PPG							
CORROLESS EPF Black	1	200	4.8	16 hrs	3 days	80	99-212-7555
S4. PERISCOPES & Masts							
Visible portions outside the submarine							
~~EPIGRIP~~ Macropoxy® L425	1	35	17.1	5 hrs	#	346	99-777-8688
IRR Matt BS285	3						
S5. SUPERSTRUCTURE CASING General steelwork							
Hempel Paints Ltd							
HEMPADUR 45880 MIO 12430	1	175	4.6	8 hrs	30 days	198	99-149-2439
HEMPADUR 47132 Black	1	125	5	9 hrs	5 days	364	
International Paint Ltd							
INTERGARD 5000	1	175	4.68	12 hrs	2 months	179	99-000-5256
INTERGARD 5000 Black	1	125	6.56	12 hrs	2 months	179	
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® M922M Mastic Aluminium	2	200	4.2	4hrs	#	146	99-495-3873
~~RESISTEX~~ Macropoxy® M535 Black	2	75	5.3	2	#	502	99-453-1479
Maker Coating Systems Ltd/PPG							
AMERLOCK 400C Black	2	125	7	16 hrs	#	106	17-106-6001
S6. WALKWAYS ON STEEL CASING Black							
Chugoku Paints (UK) Ltd							
UMEGUARD HS SILVER	1	125	7.4	20 hrs	30 days	158	
CAMIDECK FINISH TYPE 1	2	190	2.84	16 hrs	#	374	
Hempel Paints Ltd							
HEMPADUR 45880 MIO 12430	1	100	8.2	7hrs	6 hrs*	168	99-803-7233
HEMPEL'S NON SKID 45340 TYPE 1	2	200	3.2	6 hrs	30 days	347	99-480-7979
International Paint Ltd							
INTERGARD 5000	1	150	5.47	12 hrs	4 days	179	99-000-5256
INTERSHIELD 852 TYPE 1	2	200	1.92	12 hrs	#	134	99-250-1864
Maker Coating Systems Ltd							
AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
AMERLOCK 400 NS TYPE 1	2	300	4	16 hrs	#	106	99-184-8542
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C425V2	1	125	76.0	5 hrs	#	186	99-786-7949
EPIDEK M377 TYPE 1	2	250	2.5	4 hrs	#	330	99-777-8692
PPG Protective & Marine Coatings							
AMERCOAT 137	1	125	3.9	12 hrs	3 days	264	
AMERCOAT 138G	1	1300	0.6	24 hrs	#	168	

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S7. INTERNAL DRY SPACES White							
Chugoku Paints (UK) Ltd							
UMEGUARD HS SILVER	1	125	7.4	20 hrs	30 days	158	
CAMACRYL FINISH	2	40	11	24 hrs	#	33	99-380-7010
Hempel Paints Ltd							
HEMUDUR PRIMER 18500	1	60	8.8	6 hrs	1 week	22	99-876-8090
HEMUCRYL ENAMEL 58100	2	30	13.7	6 hrs	2 hrs	53	99-229-0228
International Paint Ltd							
INTERGARD 5000	1	125	6.56	12 hrs	#	179	99-000-5256
INTERCRYL 700	1	35	11.42	60 mins	#	50	99-979-7888
Jotun Paints (Europe) Limited							
WATERFINE PRIMER	2	100	4.6	1.5 hrs	#	100	99-462-9708
WATERFINE TOPCOAT	2	50	7.2	1.5 hrs	#	195	99-372-9140
Maker Coating Systems Ltd							
AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
AMERCOAT 300A	2	50	10.4	16 hrs	#	0	17-108-8249
PPG Protective & Marine Coatings							
SIGMA AQUACOVER 257150	2	75	6.6	4 hrs	#	31	99-321-6318
SIGMA AQUACOVER 457520	2	50	6.8	6 hrs	#	17	99-225-7360
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C425V2	1	125	6.0	5 hrs	#	186	99-786-7949
~~ENVIROGARD~~ Sher-Cryl™ M770	2	25	15.6	3 hrs	#	78	99-231-3852
S8. INTERIOR WET COMPARMENTS (Complete Represervation) White							
Chugoku Paints (UK) Ltd							
UMEGUARD HS SILVER	1	125	7.4	20 hrs	30 days	158	
AQUALIFE GLOSS FINISH	2	40	10	16 hrs	7 days	132	99-371-8400
Hempel Paints Ltd							
HEMUDUR 45880 MIO 12430	1	125	6.5	5 hrs	#	198	99-803-7233
HEMPEL'S WATER BASED EPOXY 48582	1	80	6.7	12 hrs	15 days	0	
International Paint Ltd							
INTERGARD 5000 Grey	1	125	6.56	24 hrs	#	179	99-000-5256
INTERGARD 1735	1	50	11.2	12 hrs	#	132	
Jotun Paints (Europe) Limited							
WATERFINE PRIMER Grey	1	100	4.6	1.5 hrs	#	60	99-462-9708
WATERFINE PRIMER	1 or 2	40	11.6	1.5 hrs	#	60	
Maker Coating Systems Ltd							
AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
AMERCOAT 300A	1	50	10.4	16 hrs	#	0	17-108-8249
PPG Protective & Marine Coatings							
SIGMACOVER 456 HS 7712	2	75	9.7	8 hrs	#	277	
SIGMASHIELD 420	1	150	5.6	3½ hrs	14 days	239	
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C425V2	1	125	6.0	5 hrs	#	186	99-786-7949
~~BIOGARD~~ Macropoxy® M630V2	1	75	6.8	24 hrs	#	0	99-313-4440

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S9. GROUP EXHAUST VALVES							
Sherwin-Williams Protective & Marine Coatings							
DOX-ANODE 5V2	1	75	8.7	24 hrs	#	470	
S10. DSRV SEATING							
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C425V2	1	175	4.3	8 hrs	#	186	99-786-7949
EPIDECK L716	2	75	6.8	4 hrs	#	420	99-225-0689
S11. INTERIOR PRESSURE HULL SURFACE Emergency Cooling Tanks (NP approval req'd))							
a) S Class Soft and Saddle Tanks							
Hempel Paints Ltd							
GALVOSIL 15700 – Approved by Rolls Royce	1	75	8.53	36 hrs	#	434	99-593-8923
International Paint Ltd							
INTERGARD 5000 – Pending Approval	2	125	6.56	12 hrs	3 months	179	99-000-5256
b) Trafalgar Class Hard Tank							
International Paint Ltd							
INTERGARD 5000 – Pending Approval	2	125	6.56	12 hrs	3 months	179	99-000-5256
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C251 – Pending Approval	2	125	5.9	24 hrs	28 days	235	99-284-3464
PPG Protective & Marine Coatings							
SIGMA PHENGUARD 930 Primer -Approved by Rolls Royce	1	100	6.6	36 hrs	21 days	300	99-667-6118
SIGMA PHENGUARD 935 Coating -Approved by Rolls Royce	1	100	6.6	24 hrs	21 days	300	99-925-0882
SIGMA PHENGUARD 940 Finish -Approved by Rolls Royce	1	100	6.6	24 hrs	21 days	300	99-976-1657
SIGMAGUARD 795 (Maintenance)	2	150	5.0	10hrs	21 days	273	
Maker Coating Systems Ltd							
CORROLESS EPF – Approved by Rolls Royce	1	200	4.8	16hrs	3 days	80	25-150-0972
CORROLESS RF35 – Approved by Rolls Royce	1	200	4.8	16hrs	3 days	93	99-337-0778
c) Trafalgar Class Jacket Tank							
International Paint Ltd							
INTERGARD 5000 - Approved by Rolls Royce	2	125	6.56	12 hrs	3 months	179	99-000-5256
Maker Coating Systems Ltd							
CORROLESS EPF – Approved by Rolls Royce	1	200	4.8	16hrs	3 days	80	25-150-0972
CORROLESS RF35 – Approved by Rolls Royce	1	200	4.8	16hrs	3 days	93	99-337-0778
AMERLOCK 400C – Approved by Rolls Royce	2	125	7	16 hrs	3 days	106	17-108-8248
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® M922	2	200	4.2	4hrs	#	143	99-834-8384
~~EPIGRIP~~ Macropoxy® C251 – Pending Approval	2	125	5.9	24 hrs	28 days	235	99-284-3464

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S11. (cont) INTERIOR SURFACES							
d) Vanguard Class High Pressure Decay Heat Removal Tank (HPDR)							
International Paint Ltd							
INTERGARD 5000 – Pending Approval	2	125	6.56	12 hrs	3 months	179	99-000-5256
Sherwin-Williams Protective & Marine Coatings							
EPIGRIP C251 – Pending Approval	2	125	5.9	24 hrs	28 days	235	99-284-3464
Maker Coating Systems Ltd							
CORROLESS EPF – Pending Approval	1	200	4.8	16hrs	3 days	80	25-150-0972
CORROLESS RF35 – Pending Approval	1	200	4.8	16hrs	3 days	93	99-337-0778
AMERLOCK 400C – Pending Approval	2	125	7	16 hrs	3 days	106	17-108-8248
PPG Protective & Marine Coatings							
SIGMA PHENGUARD 930 Primer – Approved by Rolls Royce	1	100	6.6	36 hrs	21 days	315	99-667-6118
SIGMA PHENGUARD 935 Coating – Approved by Rolls Royce	1	100	6.6	24 hrs	21 days	315	99-925-0882
SIGMA PHENGUARD 940 Finish – Approved by Rolls Royce	1	100	6.6	24 hrs	21 days	315	99-976-1657
SIGMAGUARD 795 (Maintenance)	2	150	5.0	10hrs	21 days	273	
EXTERNAL SURFACES							
International Paint Ltd							
INTERGARD 5000 – Pending Approval	2	125	6.56	12 hrs	3 months	179	99-000-5256
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C251 – Pending Approval	2	125	5.9	24 hrs	28 days	235	99-284-3464
Maker Coating Systems Ltd							
CORROLESS EPF	1	200	4.8	16hrs	3 days	80	25-150-0972
CORROLESS RF35	1	200	4.8	16hrs	3 days	93	99-337-0778
AMERLOCK 400C	2	125	7	16 hrs	3 days	106	17-108-8248
PPG Protective & Marine Coatings							
SIGMA PHENGUARD 930 Primer - Approved by Rolls Royce	1	100	6.6	36 hrs	21 days	315	99-667-6118
SIGMA PHENGUARD 935 Coating - Approved by Rolls Royce	1	100	6.6	24 hrs	21 days	315	99-925-0882
SIGMA PHENGUARD 940 Finish - Approved by Rolls Royce	1	100	6.6	24 hrs	21 days	315	99-976-1657
SIGMAGUARD 795 (Maintenance)	2	150	5.0	10hrs	21 days	273	
e) Astute Class							
Advanced Polymer Coatings							
SILOXIRANE 2031LE – Approved by Rolls Royce	2	150	1.72	24 hrs	3 days	102	
Sherwin-Williams Protective & Marine Coatings							
~~DURAGLASS~~ Magnalux 41V – Approved by Rolls-Royce	2	500	0.84	2½ hrs	#	150	

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S12. REACTOR COMPARTMENT White							
a) Interior surfaces							
Hempel Paints Ltd							
HEMPADUR NPP 55672-10000	3	75	8.5	24 hrs	21 days	327	
International Paint Ltd							
INTERGARD 5000	1	125	6.56	12 hrs	#	179	99-000-5256
INTERGARD 1735	1	50	11.20	12 hrs	#	132	
Maker Coating Systems Ltd/PPG							
AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
AMERCOAT 300A	2	50	10.4	16 hrs	#	0	17-108-8249
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C400V3	1	200	9.3	5 hrs	#	257	
~~EPIGRIP~~ Macropoxy® H766	1	50	14	5 hrs	#	395	99-623-9946
HEAT RESISTANT ALUMINIUM >250ºC							
Firwood Paints Ltd							
FIRGLO 64	1-2	25	15	4 hrs	#	620	
International Paint Ltd							
INTERTHERM 50	1-2	25	18	12hrs	#	495	99-969-0549
b) External surfaces **Refer to S1. NOTE: -** **DFT not to exceed that stated in BR3939 Section 12.**							
S13. INTERIOR DECKS							
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C425V2	1	175	4.3	8 hrs	#	186	99-786-7949
~~BIOGARD~~ Macropoxy® M630V2	1	75	6.8	24 hrs	#	0	99-255-5237
International Paint Ltd							
INTERGARD 5000	1	125	6.56	12 hrs	#	179	99-000-5256
INTERGARD 1735	1	50	11.2	12 hrs	#	132	99-255-0527
Maker Coating Systems Ltd/PPG							
AMERLOCK 400C	2	125	7	16 hrs	#	106	99-383-2335
S14. BATTERY COMPARTMENTS BS4800 00A01							
Chugoku Paints (UK) Ltd							
UMEGARD HS SILVER	1	125	7.12	20 hrs	7 days	108	
AQUALIFE GLOSS FINISH	2	40	10	16 hrs	7 days	132	99-757-9334
Hempel Paints Ltd							
HEMPADUR 45880 MIO 12430	1	150	5.5	5 hrs	#	198	99-803-7233
HEMPEL'S WATERBASED EPOXY 48582	1	80	6.7	12 hrs	15 days	0	99-988-2715
International Paint Ltd							
INTERGARD 5000	1	125	6.56	12 hrs	#	179	99-000-5256
Jotun Paints (Europe) Limited							
POLYMASTIC 2000	1	200	4.8	9 hrs	#	80	99-395-8448
POLYMASTIC 2000	1	200	4.8	9 hrs	#	80	99-665-9772
Maker Coating Systems Ltd/PPG							
AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
AMERCOAT 300A	1	50	10.4	16 hrs	#	0	99-535-8577
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C425V2	1	100	7.5	4 hrs	#	186	99-786-7949
~~BIOGARD~~ Macropoxy® M630V2	1	75	6.8	24 hrs	#	0	99-535-5105

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S15. MACHINERY SPACE BILGES & MOUNTED MACHINERY RAFTS							
Chugoku Paints (UK) Ltd							
UMEGARD HS SILVER	1	125	6.5	15 hrs	10 days	108	
UMEGARD HS GREY	1	125	6.5	15 hrs	10 days	158	99-126-9478
Finish for Mounted Machinery Rafts							
CAMACRYL FINISH MAC Canary BS381C 309	1	40	11	24 hrs	#	33	99-446-0554
Hempel Paints Ltd							
HEMPADUR 45880 White	1	150	5.5	5 hrs	#	220	99-264-0387
Finish for Mounted Machinery Rafts							
HEMUCRYL ENAMEL 58100 Canary BS381C 309	1	30	13.7	6 hrs	#	70	99-858-1263
International Paint Ltd							
INTERGARD 5000	1	175	4.68	12 hrs	3 months	179	99-000-5256
Finish for Mounted Machinery Rafts							
INTERCRYL 700 Yellow RAL 1018	1	35	11.42	6 hrs	#	50	99-774-1224
Jotun Paints (Europe) Limited							
JOTACOTE UNIVERSAL	1	125	5.8	4 hrs	#	240	
JOTAPROOF TOPCOAT	1	60	10.5	4 hrs	#	310	
Finish for Mounted Machinery Rafts							
WATERFINE TOPCOAT Canary BS381C 309	1	40	9.2	8 hrs	#	105	99-352-4369
Maker Coating Systems Ltd							
CORROLESS EPF	1	200	4.8	16 hrs	3 days	80	25-150-0972
Finish for Mounted Machinery Rafts							
AMERLOCK 400C YELLOW	1	125	7	16 hrs	#	106	
PPG Protective & Marine Coatings							
SIGMA NOVAGARD 840 7468	1	400	2.5	24 hrs	2 months	13	
Finish for Mounted Machinery Rafts							
SIGMA AQUACOVER 45 7250 Canary BS381C 309	1	50	6.8	6 hrs	#	17	99-182-2670
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® M902	1	125	6.0	6.5 hrs	#	219	99-421-0972
~~EPIGRIP~~ Macropoxy® L524	1	125	5.1	12 hrs	#	296	99-564-2934
Finish for Mounted Machinery Rafts							
~~ENVIROGARD~~ Sher-Cryl™ M770 Canary BS381C 309	1	25	15.6	3 hrs	#	78	99-726-4136
S16. BULK FUEL & OIL, LUBE OIL, HYDRAULIC & LP AIR TANKS - DEF STAN 80-97 (HIGH SOLIDS)							
Chugoku Paints (UK) Ltd							
CLEANKEEP 5000	1	300	3.33	48 hrs	14 days	0	
Hempel Paints Ltd							
HEMPADUR 85671	3	100	6.8	36 hrs	5 days	320	
International Paint Ltd							
INTERLINE 850	2	125	6.08	8 hrs	30 days	212	
Jotun Paints (Europe) Limited							
TANKGUARD STORAGE	2	125	5.0	10 hrs	30 days	261	
Maker Coating Systems Ltd							
CORROLESS EPF	1	200	4.8	16 hrs	3 days	80	25-150-0972
CORROLESS RF35 Off White	1	200	4.8	16 hrs	3 days	93	25-150-0973
PPG Protective & Marine Coatings							
SIGMAGUARD CSF 650 7443	1	300	3.3	24 hrs	20 days	17	
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® M922	2	200	5.4	4 hrs	14 days	143	99-834-8384

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S17. POTABLE WATER TANKS							
Chugoku Paints (UK) Ltd							
CLEENKEEP 5000	1	300	3.33	48 hrs	7 days	0	
Hempel Paints Ltd							
HEMPADUR MULTI STRENGTH 35560	2	200	5	24 hrs	5 days	0	
International Paint Ltd							
INTERLINE 925	1	300	3.35	48 hrs	3 days	1	
Jotun Paints (Europe) Limited							
TANKGUARD DW	2	150	6.7	12 hrs	5 days	2	
Maker Coating Systems Ltd							
CORROLESS EPF	1	200	4.8	16 hrs	3 days	80	25-150-0972
CORROLESS RF35	1	200	4.8	16 hrs	3 days	93	99-337-0778
PPG Protective & Marine Coatings							
SIGMAGUARD CSF 650 7443	1	300	3.3	24 hrs	20 days	17	
Sherwin-Williams Protective & Marine Coatings							
~~*WATERLINE*~~ *Macropoxy® P300*	1	500	2.0	6 hrs	36 hrs	0	
S18. SLOP DRAIN TANKS (alternatives being sought)							
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C251	2	125	5.9	24 hrs	28 days	235	99-284-3464
S19. AFFF TANKS (supplied with Demin Water?)							
Chugoku Paints (UK) Ltd							
CLEENKEEP 5000	1	300	3.33	48 hrs	14 days	0	
Hempel Paints Ltd							
HEMPADUR MULTI STRENGTH 35560	2	250	5.0	24 hrs	5 days	0	
International Paint Ltd							
INTERLINE 704	2	125	4.24	23 hrs	21 days	385	
Jotun Paints (Europe) Limited							
TANKGUARD DW	2	150	6.7	12 hrs	5 days	2	
Maker Coating Systems Ltd							
CORROLESS EPF	1	200	4.8	16 hrs	3 days	80	25-150-0972
CORROLESS RF35	1	200	4.8	16 hrs	3 days	93	99-337-0778
PPG Protective & Marine Coatings							
SIGMAGUARD CSF 585 7785	1	300	3.33	24 hrs	20 days	5	
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C251	2	125	5.9	24 hrs	28 days	235	99-284-3464

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S20. DEMINERALISED WATER TANKS (Max Temperature 90°C) (Inc.Hotwells, Surge, Reserve Feed, Made Water, Reactor Water Storage Tanks) **Consult 'DES SM PG-NavArch3b' for latest approved coatings.**							
Chugoku Paints (UK) Ltd							
CLEENKEEP 5000 **– RR approved – Check with ISM before use.**	1	300	3.33	48 hrs	14 days	0	
Hempel Paints Ltd							
HEMPADUR 85671 **– RR to approve**	3	100	6.8	36 hrs	21 days	320	
International Paint Ltd							
INTERLINE 925 **– RR not approved – Seeking clarification.**	1	300	3.33	18 hrs	3 days	1	
Jotun Paints (Europe) Limited							
TANKGUARD STORAGE **– RR to approve**	3	125	5.0	10 hrs	30 days	1	
Maker Coating Systems Ltd **Limited to 60°C**							
CORROLESS EPF – Approved by Rolls Royce	1	200	4.8	16 hrs	3 days	80	25-150-0972
CORROLESS RF35 – Approved by Rolls Royce	1	200	4.8	16 hrs	3 days	93	99-337-0778
PPG Protective & Marine Coatings **Limited to 60°C (specialist coating)**							
SIGMA PHENGUARD 930 Primer – Approved by Rolls Royce	1	100	6.6	36 hrs	21 days	315	99-667-6118
SIGMA PHENGUARD 935 Coating – Approved by Rolls Royce	1	100	6.6	24 hrs	21 days	315	99-925-0882
SIGMA PHENGUARD 940 Finish – Approved by Rolls Royce	1	100	6.6	24 hrs	21 days	315	99-976-1657
SIGMAGUARD 795 (Maintenance) **– RR to approve**	2	150	5.0	10hrs	21 days	273	
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C251 **– Current performance issues not resolved – Seek alternative** - Previously approved by Rolls Royce							
S21. HOLDING PRIMER (blasted steel work)							
Chugoku Paints (UK) Ltd							
NZ PRIMER S	1	25	15.9	16 hrs	#	641	
Hempel Paints Ltd							
HEMPADUR 15570 (damp surface tolerant)	1	40	13.5	#	#	414	99-943-1152
International Paint Ltd							
INTERGARD 269	1	30	15.67	6 hrs	#	411	99-983-0743
Jotun Paints (Europe) Limited							
MUKI EPS	1	20	12.5	7 hrs	7 days	610	
PPG Protective & Marine Coatings							
SIGMACOVER 280 7417	1	50	11.4	8 hrs	3 months	432	99-569-7697
Sherwin-Williams Protective & Marine Coatings							
~~METAGARD~~ Macropoxy® L574	1	25	11.6	3 hrs	#	594	99-895-9894
or							
~~EPIGRIP~~ Macropoxy® M111 (damp surface tolerant)	1	60	9.0	4 hrs	#	383	99-884-5957

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S22. PRIMERS FOR NON FERROUS METALS							
Chugoku Paints (UK) Ltd							
Aluminium: ALP 500	1	50	11.6	10 hrs	#	414	99-967-8636
Stainless Steel: UMEGUARD HS	1	125	7.40	20 hrs	30 days	158	99-126-9478
Zinc Spray & Galvanise: GALVANITE 200	1	30	14.10	4 hrs	30 days	587	99-290-5829
Hempel Paints Ltd							
Aluminium, Stainless Steel, Zinc Spray & Galvanise:							
HEMUCRYL TIE COAT 18200 (1 pack)	1	20	19.0	24 hrs	30 mins	40	99-199-2908
or							
HEMPADUR 15553 (2 pack)	1	50	8.6	2 hrs	#	515	99-870-0653
Indicator coat for FRP HIGH PROTECT Cream	1	200	5.0	8 hrs	5 days	10	99-517-4318
International Paint Ltd							
Aluminium, Stainless steel, Zinc Spray & Galvanise:							
INTERGARD 269	1	30	15.67	6 hrs	#	411	99-983-0743
or							
INTERGARD 276	1	30	15.67	6 hrs	#	411	
Indicator Coat for FRP: INTERLINE 925 Cream	1	300	5	18 hrs	3 days	1	
Jotun Paints (Europe) Limited							
Aluminium, Stainless Steel, Zinc Spray & Galvanise:							
WATERFINE PRIMER	1	60	7.6	1.5 hrs	#	100	99-462-9708
FRP Indicator Coat: PENGUARD HB White	2	150	3.6	8 hrs	#	390	
Maker Coating Systems Ltd / PPG							
Aluminium & Zinc Spray: AMERLOCK 400C	1	125	7	16 hrs	#	106	99-974-7400
Stainless Steel & Galvanise: SIGMACOVER 280 7417	1	50	11.4	8 hrs	6 months	432	99-569-7697
Indicator Coat for FRP: AMERLOCK 400C Green RAL 6011	2	125	7	16 hrs	#	106	17-120-4829
Sherwin-Williams Protective & Marine Coatings							
Aluminium, Stainless Steel & Galvanise:							
~~EPIGRIP~~ Macropoxy® L425	1	35	17.1	5 hrs	#	346	99-777-8688
Zinc Spray: ~~METAGARD~~ Macropoxy® L574	1	25	11.6	4 hrs	#	594	99-895-9894
Indicator Coat for FRP: ~~EPIGRIP~~ Macropoxy® C425V2 Off White	2	150	5	4 hrs	#	186	99-133-8714
S23. HIGH EROSION AREAS							
Hempel Paints Ltd							
HEMPADUR MULTISTRENGTH GF35970	1	300	2.9	16 hrs	30 days	180	
International Paint Ltd							
INTERZONE 505	1	300	3.0	6 hrs	4 days	157	
Maker Coating Systems Ltd							
CORROLESS EPF	2	200	4.8	16 hrs	3 days	80	99-212-7555
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® M922	1	400	4.2	#	#	143	99-834-8384

ANNEX J
SUBMARINES

Proposed Systems/Materials	Number of Coats	NDFT per coat microns	Theo SR m²/litre	Min@ 20° Recoat Interval	Max@ 20° Recoat Interval	VOC gms per ltr	NATO Stock Number
S24. BENEATH TILING							
Wessex Resins: UW46 Primer UW 46 Adhesive							99-593-3008 99-297-7593
S25. SYSTEM FOR COATING NATURAL RUBBER MOUNTS (applied by mount supplier not to be touched up once fitted)							
Dunlop Precision Rubber Ltd: DUNLOP NPL 100	2	25					
Maker Coating Systems Ltd: GUMMIPAINT - ORANGE	2	35					
S26. INTERNAL NUTS & BOLTS AND TO FILL GAPS BETWEEN CANNING PLATES & LEAD SHIELDING							
Maker Coating Systems Ltd CORROLESS CCI 355 CORROSION INHIBITOR (HD GREASE)	1	N/A			N/A	N/A	99-676-5736
S27. SEA WATER TANKS							
Chugoku Paints (UK) Ltd IMO PSPC							
UMEGUARD HS	2	160	5.08	15 hrs	10 days	108	
or							
BANNOH 1500	2	160	4.56	19 hrs	30 days	286	
Hempel Paints Ltd IMO PSPC							
HEMPADUR QUATTRO	2	160	4.5	6 hrs	90 days	275	
International Paint Ltd IMO PSPC							
INTERGARD 5000	2	160	5.13	12 hrs	3 months	179	99-000-5256
Jotun Paints (Europe) Limited IMO PSPC							
BALLOXY HB LIGHT	2	160	5.16	10 hrs	#	150	17-108-7824
Maker Coating Systems Ltd							
CORROLESS EPF	2	200	4.8	16 hrs	3 days	80	25-150-0972
Maker Coating Systems Ltd/ PPG IMO PSPC							
SIGMACOVER 240 7991	2	160	5.4	5 hrs	30 days	153	
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® L524 (typical dft 125. care req'd on overlap at 160)	2	160	3.9	12 hrs	#	296	99-564-2934
S28. CHALFONT / LILO / PAYLOAD BAY CHAMBER (Internal)							
Consult 'DES SM PG-NavArch3b' for latest approved coatings.							
'A'-Boat at build: -							
Sherwin-Williams Protective & Marine Coatings							
~~EPIGRIP~~ Macropoxy® C425V2	2	75	7.5	4 hrs	#	186	99-786-7949
~~EPIGRIP~~ Macropoxy® M262	1	75	8	4 hrs	#	354	-
International Paint Ltd							
INTERZONE 505 (proposed coating)	1	300	3.0	6 hrs	4 days	157	
High abrasion resistant / immersion in sea water / low VOC / internal fire rated / black and white finish coats - systems desirable. Seek full requirements							

ANNEX J
SUBMARINES

Supplier	Material	BR Class	VOC Compliant	NSN
Chugoku Paints (UK) Ltd	CAMACRYL FINISH MAC White	See 4.3	86 g/l	8010-99-380-7010
Chugoku Paints (UK) Ltd	CAMACRYL FINISH MAC Ash Grey BS4800 00A01	See 4.3	86 g/l	8010-99-676-4126
Chugoku Paints (UK) Ltd	ALP 500	See 4.3	414 g/l	8010-99-967-8636
Chugoku Paints (UK) Ltd	GALVANITE 200 White	See 4.3	495 g/l	8010-99-995-4247
Chugoku Paints (UK) Ltd	GALVANITE 200 White	See 4.3	495 g/l	8010-99-290-5829
Chugoku Paints (UK) Ltd	UMEGUARD HS Grey	See 4.3	158 g/l	8010-99-126-9478
Chugoku Paints (UK) Ltd	UMEGUARD HS White	See 4.3	158 g/l	8010-99-564-2409
Chugoku Paints (UK) Ltd	CAMACRYL FINISH MAC Canary BS381C 309	See 4.3	86 g/l	8010-99-446-0554
Chugoku Paints (UK) Ltd	CAMACRYL FINISH MAC Wedgewood Blue BS4800 18D43	See 4.3	86 g/l	8010-99-665-3660
Chugoku Paints (UK) Ltd	CAMACRYL FINISH MAC Dark Blue BS4800 18C39	See 4.3	86 g/l	8010-99-862-0034
Chugoku Paints (UK) Ltd	CAMACRYL FINISH MAC Mid Brunswick Green BS381C 226	See 4.3	86 g/l	8010-99-794-2129
Chugoku Paints (UK) Ltd	CAMACRYL FINISH MAC Azure Blue BS381C 104	See 4.3	86 g/l	8010-99-366-5444
Hempel UK Limited	HEMPADUR 15570 LIGHT GREY 12430	See 4.3	430 g/l	8010-99-170-5097
Hempel UK Limited	HEMPADUR 15553 Off White 11630 5ltr	See 4.3	515 g/l	8010-99-870-0653
Hempel UK Limited	HEMPADUR 15553 Off White 11630 20ltr	See 4.3	515 g/l	8010-99-700-4191
Hempel UK Limited	HEMUDUR 18500 Grey 12170	See 4.3	85 g/l	8010-99-867-8090
Hempel UK Limited	HEMPELS WATER BASED EPOXY 48580 BS4800 14C39 (Green)	See 4.3	25 g/l	8010-99-279-8221
Hempel UK Limited	HEMPELS WATER BASED EPOXY 48580 BS381C 676 (Light Weatherwork Grey)	See 4.3	25 g/l	8010-99-976-9118
Hempel UK Limited	HEMPELS WATER BASED EPOXY 48580 Black	See 4.3	25 g/l	8010-99-864-5046
Hempel UK Limited	HEMPELS WATER BASED EPOXY 48580 BS4800 00A01	See 4.3	25 g/l	8010-99-988-2715
Hempel UK Limited	HEMPELS NON-SKID 45340 Type 1 Black	See 4.3	347 g/l	8010-99-351-4222
Hempel UK Limited	HEMUCRYL TIE-COAT 18200 Red 50710	See 4.3	118 g/l	8010-99-199-2908
Hempel UK Limited	HEMPELS GALVOSIL 15700	See 4.3	535 g/l	8010-99-593-8923
Hempel UK Limited	HEMUCRYL ENAMEL 58100 White	See 4.3	150 g/l	8010-99-299-0228
Hempel UK Limited	HEMUCRYL ENAMEL 58100 Dark Blue BS4800 18C39	See 4.3	150 g/l	8010-99-290-5925
Hempel UK Limited	HEMUCRYL ENAMEL 58100 Wedgewood Blue BS4800 18D43	See 4.3	150 g/l	8010-99-317-6235
Hempel UK Limited	HEMUCRYL ENAMEL 58100 Canary BS381C 309	See 4.3	150 g/l	8010-99-858-1263
Hempel UK Limited	HEMUCRYL ENAMEL 58100 Lt Brunswick Green BS381C 225	See 4.3	150 g/l	8010-99-831-8959
Hempel UK Limited	HEMUCRYL ENAMEL 58100 Azure Blue BS381C 104	See 4.3	150 g/l	8010-99-382-4025
Hempel UK Limited	HEMUCRYL ENAMEL 58100 Mid Brunswick Green BS381C 226	See 4.3	150 g/l	8010-99-162-2531
Hempel UK Limited	HEMUCRYL ENAMEL 58100 BS4800 00A01	See 4.3	150 g/l	8010-99-660-9288
Hempel UK Limited	HEMUCRYL ENAMEL 58100 Signal Red BS381C 537	See 4.3	150 g/l	8010-99-250-8046
Hempel UK Limited	HEMUCRYL ENAMEL 58100 Black	See 4.3	150 g/l	8010-99-175-1334
Hempel UK Limited	HEMUCRYL ENAMEL 58100 BS381C 676 (Light Weatherwork Grey)	See 4.3	150 g/l	8010-99-149-2439
Hempel UK Limited	HEMUCRYL PRIMER 18100	See 4.3	200 g/l	8010-99-909-6026
International Paint Ltd	INTERGARD FWA274/FWA278 Red	See 4.3	166 g/l	8010-99-337-6056
International Paint Ltd	INTERGARD 5000 BS4800 00A01 Dawn Grey	See 4.3	179 g/l	8010-99-000-5256
International Paint Ltd	INTERGARD 1735 WB QDE000/QDA049 BS4800 00A01	See 4.3	45 g/lt	8010-99-255-0527
International Paint Ltd	INTERGARD 1735 WB Dark Sea Grey BS381C 640	See 4.3	132 g/l	8010-99-702-0607
International Paint Ltd	INTERGARD 1735 WB Green BS4800 14C39	See 4.3	132 g/l	8010-99-483-1994
International Paint Ltd	INTERGARD 740 ECY999/A Black	See 4.3	420 g/l	8010-99-285-3824
International Paint Ltd	INTERCRYL 506 GREY WPA300	See 4.3	120 g/l	8010-99-147-1269
International Paint Ltd	INTERCRYL 700 White WXB000	See 4.3	50 g/l	8010-99-979-7888
International Paint Ltd	INTERCRYL 700 Yellow RAL 1018	See 4.3	50 g/l	8010-99-774-1224
International Paint Ltd	INTERSHIELD 852 NON-SKID Type 1 Black	See 4.3	134 g/l	8010-99-250-1864

ANNEX J
SUBMARINES

Supplier	Material	BR Class	VOC Compliant	NSN
Jotun Paints (Europe) Limited	PRIMASTIC UNIVERSAL MD	See 4.3	240 g/l	8010-99-509-7172
Jotun Paints (Europe) Limited	WATERFINE PRIMER Light Grey	See 4.3	50 g/l	8010-99-462-9708
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Signal Red BS381C 537	See 4.3	197 g/l	8010-99-921-4654
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Lt Brunswick Green BS381C 225	See 4.3	197 g/l	8010-99-131-6457
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT White	See 4.3	197 g/l	8010-99-372-9140
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Wedgwood Blue BS4800 18D43	See 4.3	197 g/l	8010-99-212-5714
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Azure Blue BS381C 104	See 4.3	197 g/l	8010-99-186-9127
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Dark Blue BS4800 18C39	See 4.3	197 g/l	8010-99-347-9130
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Lt Weatherwork Grey BS381C 676	See 4.3	197 g/l	8010-99-989-6214
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT CANARY BS381C 309	See 4.3	197 g/l	8010-99-352-4369
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Black	See 4.3	197 g/l	8010-99-877-1641
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Mid Brunswick Green BS381C 226	See 4.3	197 g/l	8010-99-873-4271
Jotun Paints (Europe) Limited	WATERFINE TOPCOAT Ash Grey BS4800 00A01	See 4.3	197 g/l	8010-99-272-2784
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 Black	See 4.3	17g/l	8010-99-500-7412
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 Mid Brunswick Green BS381C 226	See 4.3	17g/l	8010-99-269-1301
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 Wedgwood Blue BS4800 18D43	See 4.3	17g/l	8010-99-471-2071
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 Azure Blue BS381C 104	See 4.3	17g/l	8010-99-863-5457
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 Canary BS381C 309	See 4.3	17g/l	8010-99-182-2670
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 Dark Blue BS4800 18C39	See 4.3	17g/l	8010-99-957-7697
Maker Coating Systems Ltd	SIGMA AQUACOVER 25 7150 Buff	See 4.3	37g/l	8010-99-321-6318
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 Lt Brunswick Green BS381C 225	See 4.3	17g/l	8010-99-338-4734
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 Signal Red BS381C 537	See 4.3	17g/l	8010-99-880-0100
Maker Coating Systems Ltd	SIGMA AQUACOVER 45 7250 White	See 4.3	17g/l	8010-99-225-7360
Maker Coating Systems Ltd	AMERCOAT 300A Black	See 4.3	0 g/l	8010-17-115-8450
Maker Coating Systems Ltd	AMERCOAT 300A White	See 4.3	0 g/l	8010-17-108-8249
Maker Coating Systems Ltd	AMERCOAT 300A BS4800 00A01 Ash Grey	See 4.3	0 g/l	8010-99-535-8577
Maker Coating Systems Ltd	AMERCOAT 300A BS4800 14C39 Green	See 4.3	0 g/l	8010-17-113-5690
Maker Coating Systems Ltd	AMERLOCK 400C Grey	See 4.3	106 g/l	8010-99-974-7400
Maker Coating Systems Ltd	AMERLOCK 400C Black	See 4.3	106 g/l	8010-17-106-6001
Maker Coating Systems Ltd	AMERLOCK 400C White	See 4.3	106 g/l	8010-17-108-8248
Maker Coating Systems Ltd	AMERLOCK 400C RAL 6018 Yellow-Green	See 4.3	106 g/l	8010-99-383-2335
Maker Coating Systems Ltd	AMERLOCK 400C Non-Skid Type 1 Black	See 4.3	106 g/l	8010-99-184-8542
Maker Coating Systems Ltd	CORROLESS EPF Buff	See 4.3	80 g/l	8010-25-150-0972
Maker Coating Systems Ltd	CORROLESS EPF Black	See 4.3	80 g/l	8010-99-212-7555
Maker Coating Systems Ltd	CORROLESS RF 35 Off White	See 4.3	93 g/l	8010-25-150-0973
Maker Coating Systems Ltd	CORROLESS RF 35	See 4.3	93 g/l	8010-99-337-0778
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 White	See 4.3	128 g/l	8010-99-231-3852
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Black	See 4.3	128 g/l	8010-99-768-1426
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Signal Red BS381C 537	See 4.3	128 g/l	8010-99-225-7155
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Canary BS381C 309	See 4.3	128 g/l	8010-99-726-4136
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Dark Blue BS4800 18C39	See 4.3	128 g/l	8010-99-723-3650
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Azure Blue BS381C 104	See 4.3	128 g/l	8010-99-878-8150
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Ash Grey BS4800 00A01	See 4.3	128 g/l	8010-99-517-5228
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Lt Brunswick Green BS381C 225	See 4.3	128 g/l	8010-99-313-9445
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Mid Brunswick Green BS381C 226	See 4.3	128 g/l	8010-99-862-5170
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Grey BS381C 676	See 4.3	128 g/l	8010-99-833-4765
Sherwin-Williams P&MC	~~ENVIROGARD~~ Sher-Cryl™ M770 Wedgewood Blue BS4800 18D43	See 4.3	128 g/l	8010-99-723-3651
Sherwin-Williams P&MC	EPIDEK L716 Black	See 4.3	420 g/l	8010-99-225-0689
Sherwin-Williams P&MC	EPIDEK M377 Non-Skid Type 1 Black	See 4.3	330 g/l	8010-99-777-8692
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® C251	See 4.3	235 g/l	8010-99-284-3464
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® C425V2	See 4.3	186 g/l	8010-99-786-7949
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® M111	See 4.3	383 g/l	8010-99-884-5957
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® M902 Aluminium	See 4.3	219 g/l	8010-99-421-0972
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® L425	See 4.3	346 g/l	8010-99-777-8688
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® L524 Aluminium	See 4.3	296 g/l	8010-99-216-0021
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® L524 White	See 4.3	296 g/l	8010-99-564-2934
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® M922M Mastic Aluminium	See 4.3	146 g/l	8010-99-495-3873
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® M630V2 Black	See 4.3	0 g/l	8010-99-739-8402
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® M630V2 White	See 4.3	0 g/l	8010-99-313-4440
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® M630V2 Green BS4800 14C39	See 4.3	0 g/l	8010-99-255-5237
Sherwin-Williams P&MC	~~EPIGRIP~~ Macropoxy® M630V2 Grey BS381C 676	See 4.3	0 g/l	8010-99-131-6908
Sherwin-Williams P&MC	~~RESISTEX~~ Macropoxy® M535 Black	See 4.3	502 g/l	8010-99453-1479

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