HD-14 HULL CLEANING AND PAINTING

The intent of this specification item is to clean the entire hull, repair any defective paintwork and paint the ship's hull to the top of the bulwarks. Contractor shall supply all coatings, paints, equipment, and hardware necessary for the cleaning and painting of the underwater and above water areas of the hull.

HD-14.1
The vessels underwater hull area shall be cleaned of all growth. The existing low friction coating shall be repaired and/or renewed utilizing International Marine Coatings.

HD-14.2
Contractor shall prepare the underwater hull and apply the coating system in accordance with the manufacturer's recommendations. In conjunction with any functional Q & A procedure, the following points shall be carried out:

HD-14.2.1. > Provide a list of batch numbers with correspondent dates of manufacture.
HD-14.2.2. > Record the quantity and type of any solvent added.
HD-14.2.3. > Measure and record the ambient conditions.
HD-14.2.4. > Record details of spray tips and pressures.
HD-14.2.5. > WFT gauge readings shall be taken on a regular basis during application.
HD-14.2.6. > Using a calibrated DFT gauge, fifteen (15) measurements per 100 square ft. shall be taken and recorded. Upon agreement of consistency with the CGTA, fifteen (15) measurements per 1000 square ft. shall be taken and recorded.

HD-14.3
All recorded information shall be typewritten and three (3) copies given to the CGTA.

HD-14.4
All hull mounted equipment and appliances such as the 4 anodes, 2 reference cathodes, 2 echo sounder plates, and the speed log shall be effectively covered and sealed using thin masonite or equivalent to protect these items from damage during all phases of hull preparation and coating. Greases and mastic type compounds shall not be used. All protective coverings shall be removed upon completion of all work.

HD-14.5
Contractor shall hydro blast the entire hull area, including areas above the water line up to the top of all bulwarks. This shall include rudders, propellers and the thruster tube. Hydro blasting shall be done at 10,000 psi minimum. All marine growth, salts, and surface contaminants shall be removed. This work shall be done as soon as possible after docking the vessel.

NOTE: The amount of marine growth on the underwater hull has been quite heavy in recent years. Contractor shall quote on what would be considered a "heavy" marine growth.

HD-14.6
The CGTA and TCMSS Surveyor shall then inspect the entire hull for defects and deficiencies.

HD-14.7
Contractor shall take precautions to ensure that no damage, unnecessary cleaning, or repairs shall occur from abrasive blasting and/or the application of coatings.

HD-14.8
Grit used for blasting shall not be allowed to enter any part of the vessel or its exposed equipment, and where such ingress may occur, the equipment shall be suitably protected.

HD-14.9
Prior to grit blasting the hull, Contractor shall temporarily mark the original location of each hull symbol so that the GSM decals can be applied, upon completion of all work, as per their subsequent original locations.

HD-14.10
Contractor shall plug deck scuppers and discharges as well as taking other measures necessary to prevent any liquids from contaminating areas being prepared or coated. Contractor shall ensure that every opening into the vessel where grit can gain entry is suitably covered.

HD-14.11
Measures shall be taken to ensure that surfaces and equipment other than those specified are not coated and that any inlets or discharges will not be blocked by the coating or grit. Contractor is responsible for removing any over spray on the vessel as a result of this work. Deck machinery and other gear, susceptible to damage by grit or coating material is also shall be protected as necessary.

HD-14.12
Contractor shall quote a unit price per square meter for abrasive blasting for adjustment purposes. Adjustment shall be negotiated through PWGSC 1379 action.

HD-14.13
Areas of obvious concern include but are not limited to:

HD-14.13.1. > stem tubes
HD-14.13.2. > sea bay and chests
HD-14.13.3. > overboard discharge valves
HD-14.13.4. > machinery spaces
HD-14.13.5. > funnel outlets
HD-14.13.6. > searchlights
HD-14.13.7. > navigation equipment
HD-14.13.8. > air intake plenums and air intake and exhaust trunking;
HD-14.13.9. > accommodations air intake and exhaust plenums and trunking
HD-14.13.10. > barge, lifeboat, FRC
HD-14.13.11. > deck machinery including crane and winches
HD-14.13.12. > exposed steel wires for davits, winches, etc.
HD-14.13.13. > rudder trunk void

HD-14.14
Sea bay grids shall be protected during application of all coatings. Orifice diameters shall be verified as original before undocking (i.e. not blocked or reduced). Scuppers and overboard discharges in use shall be fitted with extension tubes to prevent liquid run off onto the ship's hull while coatings are curing.

HD-14.15
Contractor shall apply a combination of 2 painting schemes to the hull of the ship, below and above the waterline.

Painting scheme consists of:

HD-14.15.1. > A 2 meter band of Inerta 160 applied in an area 1 meter above and 1 meter below the water line. The height above the waterline shall be increased, taper upwards in the bow area to same height as the top of the anchor pockets, including around the bow stem. Also, in the bow area, the Inerta 160 shall be increased below the waterline to the bottom of the ice knife. Approximate area is 450 square meters. Work to be done in conjunction with HD-14.19.

HD-14.15.2. > Epoxy paints (Intershield 300 & 803 + Interthane 990 for above the water line & 0.6 meter below the water line as a top coat) for all other hull areas including the "fish plate" fitted to the boat deck level. Approximate area is 2000 square meters.

Note: The whole underwater area of the ship's hull and the rudder is presently coated with an International Intershield 300 & Intergard 377 over an original coating of Inerta. Contractor shall consult with and adhere to the manufacturer's recommendations for preparing the existing hull coating, bare spots and applying the new coating.

BELOW WATERLINE AREA EPOXY PAINT

HD-14.16
The area is approximately 1450 square meters.

HD-14.17
All shell areas containing loose paint and/or bared steel shall be dry abrasive blasted to bare steel condition. Corroded and damaged areas spot grit blast to SA2 STD and remaining all areas full grit blast to SA1. Apply the coating material before visible oxidation occurs. If oxidation does occur, the entire oxidised surface shall be re-blasted to the standard specified above. Contractor shall bid on abrasive blasting, to the above noted standard, 50% of the underwater hull surface (approximately 720 square meters). Contractor shall quote on a unit price per square meter for adjustment purposes. All coating edges shall be feathered back a minimum of 300mm. The hull shall be swept clean of all traces of grit with compressed air. The surface profile shall have a minimum roughness of 2-3 mils. Surface profile required on the bare metal of 3-4 mils

HD-14.18

Table HD-14.1 Underwater Hull Coatings below Inerta Band

Product	Sales Code	Colour	Coats	WFT Mils	Volume Solids (%)	DFT Mils
Intershield 300	ENA301/A	Aluminum	50% TU	8.3	60	5.0
Intershield 300	ENA300/A	Bronze	FC	8.3	60	5.0
Intershield 803	EGA807/A	Grey	FC	8.0	75	6.0
Intershield 803	EGA808/A	Red	FC	8.0	75	6.0
				32.6		22.0

INERTA BAND & BOW AREA

HD-14.19
All existing paint systems in a 2 meter band, 1 meter above and 1 meter below the water line plus the following additions:

HD-14.19.1. > The height above the waterline shall be increased, taper upwards in the bow area to same height as the top of the anchor pockets, including around the bow stem.

HD-14.19.2. > Also, in the bow area, the area shall be increased below the waterline to the bottom of the ice knife.

This entire area shall be abrasive blasted to a condition of Sa 2-1/2. Surface profile required on the bare metal of 3-4 mils, approximate area is 450 square meters.

HD-14.20
Contractor shall apply the coatings as listed in Table HD-14.2 in the Inerta Band area

Table HD-14.2 Coatings

*Intershield 163 Inerta 160	ERA162/A	Red	FC	21.1	95	20
Intershield 163 Inerta 160	ERA162/A	Red	FC	10.5	95	10

HD-14.21
Contractor shall apply the Interthane 990 CCGS RED RAL3000 (over the inerta 160) down below the water line 0.6 of a meter to ensure a continuous coatings of the hull topsides, 1 coat.

ABOVE WATERLINE AREAS

The ship's above water area is approximately 750 square meters.

HD-14.22
All paint system damage areas above the waterline and up to the top of the bulwarks, including the weld deck area, focsile and upper deck areas (all above the Inerta 160 band area) shall be abrasive blasted to a condition of Sa2 and all remaining areas full grit blast to SA1 to produce a surface profile of 3 mils minimum. Contractor shall apply the coating material before visible oxidation occurs. If oxidation does occur, the entire oxidised surface shall be re-blasted to the standard specified above.

Note, This shall also include the fishplate apron around the helicopter deck, from Frame 90 Port, around the stern area of the vessel, to Frame 90 on the starboard side.

Contractor shall bid on abrasive blasting, to the above noted standard, 50% of the above waterline surface (approximately 350 square meters).

HD-14.23
Contractor shall remove the helicopter deck net and stanchions. Contractor shall fit temporary stanchions to helicopter deck and fit rope to protect yard/ship personnel from falling overboard. Contractor shall grit blast and paint all of the stanchions as per upper hull painting scheme. Upon completion of all work, all painted stanchions and associated net shall be fitted to the ship, using new stainless steel fasteners.

HD-14.24
Contractor shall apply the coatings as listed in Table HD-14.3 in the Upper hull area

Table HD-14.3 Coatings

Product	Sales Code	Colour	Coats	WFT Mils	Volume Solids (%)	DFT Mils
Intershield 300	ENA300/A	Bronze	50% TU	8.3	60	5.0
Intershield 803	EGA807/A	Grey	FC	8.0	75	6.0
Intershield 803	EGA808/A	Red	FC	8.0	75	6.0
**Interthane 990	PHA162/A	RAL3000 C.Guard Red	FC	3.5	57	2.0
Interthane 990	PHA163/A	RAL9003 White	FC	3.5	57	2.0
**Interthane 990	PHA162/A	RAL3000 C.Guard Red	FC	3.5	57	2.0
Interthane 990	PHA163/A	RAL9003 White	FC	3.5	57	2.0

** Colour is dependent on location

HD-14.25
Contractor shall arrange for the services of a qualified installation technician to install the hull symbol decals.

Suggested company: 3M Trimline (supplier of GSM decals)

HD-14.26
For bid purposes, Contractor shall allow $3,000 for the services of a technician to install the GSM hull identification decals. Contractor shall supply all necessary craneage, manlifts, scaffolding, manpower, materials, etc. to permit the installation of the hull decals by the technician. Final cost of the technician's services shall be adjusted accordingly upon receipt of original invoice. Actual cost shall be adjusted up or down (credit), through PWGSC 1379 action.

HD-14.27
Contractor shall quote on painting the hull symbols on by hand. This quote shall form part of the overall bid. The CG Stripes, draft marks, load lines, thruster symbols, ship's name and all government symbols and icons shall be painted white (stripe has a black band on each side of the stripe) using 2 full coats of the following products:

Table HD-14.4 Coatings

Product	Sales Code	Colour	Coats	WFT Mils	Volume Solids (%)	DFT Mils
Interthane 990	PHA163/A	RAL9003 White	FC	3.5	57	2.0
Interthane 990	PHA164/A	RAL9004 Black SG	FC	3.5	57	2.0

HD-14.28
Upon completion of all painting, Contractor shall take 40 paint thickness measurements (20 per side) in areas that were cleaned to bare steel prior to application of the coating. The measurements shall be recorded and marked on copies of the shell expansion drawing. Contractor shall be supplied with a shell expansion drawing for creating copies.

HD-14.29
All traces of grit used for blast cleaning shall be removed by Contractor. Contractor shall be responsible for ensuring that the hull is clear and clean prior to, during, and immediately after the coating application.

HD-14.30
Contractor shall remove all protective materials from the machinery, equipment and hull openings on completion of the coating work. All grit, dirt, debris, rust, scale, etc shall be removed from all decks and areas of accumulation and disposed of ashore by Contractor

HD-14.31
All staging, cranes, screens, lighting and any other support services, equipment, paint and materials necessary to carry out these specifications shall be CFM, installed, and removed upon completion of all work.

HD-14.32
Suitable storage facilities shall be provided close to the work site by Contractor for the material and equipment, to ensure they shall be maintained at the recommended temperature of the coating manufacturer for ease of preparation and proper application.

HD-14.33
All coatings shall be applied in strict accordance with the manufacturer's instructions and recommendations.

HD-14.34
All work shall be completed to the satisfaction of the CGTA.