

MIL-B-18147C(SH)  
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SUPERSEDING  
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(See 6.4)

## MILITARY SPECIFICATION

### BOATS AND CRAFT; PREPARATION FOR DELIVERY OF

This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification covers the requirements for the packaging, loading and marking of boats and craft (approximately 100 feet and under) open and cabin types, with or without installed power plants such as landing craft, personnel and utility boats, patrol boats, motor whaleboats and special warfare craft together with their associated accessories, spare and repair parts and technical data (drawings and manuals).

1.2 Classification. Delivery shall be of the following types and classes (see 3.2) as specified (see 6.2.1).

Type I - Delivery by water under power or by towing  
(see 3.2.2, 3.2.2.2, and 3.2.2.3).

Class 1 - Without installed power plant(s).

Class 2 - With installed power plant(s).

Type II - Delivery for immediate use to a domestic activity by rail, truck or vessel  
(see 3.2.3, 3.2.3.2, and 3.2.3.3).

Class 1 - Without installed power plant(s).

Class 2 - With installed power plant(s).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

FSC 1990

## MIL-B-18147C(SH)

Type III - Delivery for stock or storage to an overseas or domestic activity by rail, truck or vessel (see 3.2.4, 3.2.4.2, and 3.2.4.3).

Class 1 - Without installed power plant(s).  
Class 2 - With installed power plant(s).

Type IV - Delivery for immediate use to an overseas activity (see 3.2.5, 3.2.5.2 and 3.2.5.3).

Class 1 - Without installed power plant(s).  
Class 2 - With installed power plant(s).

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified, the following specifications and standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

## SPECIFICATIONS

## MILITARY

MIL-P-116	- Preservation, Methods of.
MIL-R-196	- Repair Parts, Accessories, and Kits, Mechanical; Packaging of.
MIL-B-208	- Battery, Storage, Lead Acid, Automotive and Navy Portable (Except Aircraft), Packaging and Packing of.
MIL-L-2105	- Lubricating Oil, Gear, Multipurpose.
MIL-P-2845	- Packaging of Main Propulsion Shafting, Bearing, Boat and Ship Propellers, and Associated Repair Parts.
MIL-E-5607	- Engine, Gas Turbine, Preparation for Storage and Shipment of, Process for.
MIL-E-10062	- Engines: Preparation for Shipment and Storage of.
MIL-E-16298	- Electric Machines Having Rotating Parts and Associated Repair Parts: Packaging of.
MIL-P-16789	- Packaging of Pumps, Including Prime Movers and Associated Repair Parts.
MIL-E-17555	- Electronic and Electrical Equipment, Accessories, and Repair Parts: Packaging and Packing of.
MIL-P-17869	- Pumps and Motors, Power, Oil Hydraulic (Naval Shipboard Use).
MIL-L-21260	- Lubricating Oil, Internal Combustion Engine, Preservative and Break-In.
MIL-H-22072	- Hydraulic Fluid, Catapult.
MIL-I-22110	- Inhibitor, Corrosion, Volatile, Crystalline.
MIL-I-24453	- Inhibitor, Corrosion, Soluble-Oil.

## MIL-B-18147C(SH)

## STANDARDS

## MILITARY

- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-758 - Packaging Procedures For Submarine Repair Parts.
- MIL-STD-1188 - Commercial Packaging of Supplies and Equipment.
- MIL-STD-1367 - Packaging, Handling, Storage, and Transportability Program Requirements (For Systems and Equipments).

2.1.2 Other Government documents and publications. The following other Government documents and publications form a part of this specification to the extent specified herein.

DEPARTMENT OF TRANSPORTATION (DOT)  
Code of Federal Regulations (CFR)  
Title 49 (100-177)

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

NATIONAL BUREAU OF STANDARDS  
Product Standard PS 1-74 - For Construction and Industrial  
Plywood with Typical APA Trademarks.

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

## PUBLICATIONS

NAVAL SEA SYSTEMS COMMAND (NAVSEA)  
S9086-AA-STM-000/CH 233 - Diesel Engines.  
S9086-AA-STM-000/CH 583 - Boats and Small Craft.

(Copies of specifications, standards, and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

## ASSOCIATION OF AMERICAN RAILROADS (AAR)

- Section 6 - Rules Governing the Loading of Department of Defense Material on Open Top Cars.
- Pamphlet no. 14 - Minimum Carloading Requirements for Freight in General Purpose and Specially Equipped Boxcars.
- Circular no. 42-G - General Rules Covering Loading of Carload Shipments of Commodities in Closed Cars.

(Application for copies should be addressed to the Association of American Railroads, Operations and Maintenance Department, 1920 L Street, NW, Washington, DC 20036.)

## MIL-B-18147C(SH)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

### 3. REQUIREMENTS

#### 3.1 General.

3.1.1 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and shall be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.1.2 Newly developed packaging materials or procedures. The use of newly developed packaging materials or procedures are encouraged, recommended, and will be permitted under the conditions specified herein, provided they are equal to or better than the specified materials or procedures.

3.1.2.1 Certification. If the contractor desires to use materials or procedures other than those specified herein, he shall furnish to the contracting activity documented evidence certified by a testing laboratory satisfactory to the activity that the material or procedure is equal to or exceeds the requirements specified herein (see 6.2.2). If, after a review of the material procedure and the related certified test report or the witnessing of the stipulated tests, it is the opinion of the contracting activity that the material or procedure meets or exceeds the requirements specified herein, authorization for use will be granted.

#### 3.1.3 Asbestos.

3.1.3.1 Packaging materials. Asbestos shall not be used in applications where a functionally equivalent asbestos free substitute is available. If an equivalent substitute is unavailable, approval for the use of asbestos shall be obtained from NAVSEA for each application. Detailed rationale shall accompany each such request.

3.1.3.2 Packaged items. Asbestos and separately packaged components containing asbestos, that is predominately distributed throughout the item shall be packaged in sealed, dust and siftproof packages. Flexible packages shall be heat sealed. Packages shall be marked as specified in 3.6.

3.1.3.3 Dusting material. Dusting materials such as talc and talcum shall be asbestos free. A certificate of compliance shall be required (see 6.2.2) stating that the dusting material is asbestos free.

## MIL-B-18147C(SH)

3.1.4 Cushioning and wrapping materials. The use of excelsior, newspaper, shredded paper (all types including wax paper), similar hygroscopic or non-neutral materials and all types of loose-fill materials, is prohibited for applications such as cushioning, filler, stuffing and dunnage. Materials selected for cushioning and wrapping shall have fire resistance properties, qualities or characteristics and be clean and dry to minimize item contamination.

3.1.5 Disassembly, matchmarking and stowage.

3.1.5.1 Disassembly. Unless otherwise specified (see 6.2.1), boat or craft and equipment disassembly shall be the minimum necessary to make accessible for cleaning, drying and preservation of installed systems, equipment and critical surfaces. Removal of secondary assemblies, accessories and projecting parts which will facilitate protection of the boat or craft, equipment or item from damage, pilferage, loss or reduction of cube shall be permitted where such removal will not affect permanent settings or alignments, and where the removed items can be readily reassembled at the installation site without the need for special tools or gages. Removed hardware (bolts, nuts, pins, screws, washers and others) shall be reinstalled in the mating parts and secured to prevent their loss. Removed items or parts, other than hardware shall be packaged as required for delivery of the acquisitioned boat or craft.

3.1.5.2 Matchmarking. Removed items, except hardware, shall be match-marked to facilitate reassembly. Removed items shall be tagged, marked and the tags attached to each mating item. The tags and printing thereon shall be resistant to oil, water and fading.

3.1.5.3 Stowage. Items, accessories, spare and repair parts, and tools removed from their operating locations and manuals packaged as specified herein shall be stowed in their designated stowage facility (bins, drawers, lockers) or in a boat or craft location when facilities are not provided and in a manner which will prevent their exposure to the elements and prevent pilferage. Material stowed above and below decks shall be secured preventing material movement, dislodgement and damage to the material, stowage facility and boat or craft during its handling, shipment, and storage.

3.1.6 Paint and gel-coat repair. Painted surfaces on which the paint is damaged or defective shall be cleaned and repainted with the original specified paint of same quality, color and paint system as originally supplied. Damaged gel-coat surfaces shall be repaired with a gel-coat resin as originally used in the boat or craft coating.

3.1.7 Lubrication. Rotating joints, bearings and similar moving parts shall be thoroughly lubricated with the lubricant specified in the equipment specification, or as approved by the contracting activity.

3.1.8 Preservative application. Cleaning processes, drying procedures, and preservatives identified by "P" numbers and their application shall be in accordance with MIL-P-116. Use of hard drying type preservatives, P-1 and P-19 shall be limited to those areas or surfaces where the preservative would not normally have to be removed prior to placing the item in operation, or where its removal by scraping or solvent action would not damage the items.

## MIL-B-18147C(SH)

3.2 Type and class delivery preparation. (See 1.2).

3.2.1 General. In addition to the requirements specified herein, the cooling (fresh) water system of craft contracted for immediate use (domestic or overseas) shall be preserved with anti-freeze and inhibitor to prevent freezing and corrosion.

3.2.2 Type I, class 1 and 2 delivery.3.2.2.1 Preservation.

3.2.2.1.1 Boat or craft. Each boat or craft shall be prepared for delivery in a manner which shall assure and provide protection against damage and which shall assure safe delivery of the boat or craft at destination. When the boat or craft is towed, the shaft(s) and rudder(s) shall be securely locked in such a manner as to prevent motion. When the craft is delivered under its own power, the contractor upon delivery at destination shall drain and replace the lubrication oil and replace disposable fuel and lubrication oil filters. Non-disposable fluid systems filters and strainers shall be cleaned and reinstalled.

3.2.2.1.2 Spare and repair parts, tools and manuals. Preparation for shipment shall be as specified in 3.4.

3.2.2.2 Packing.

3.2.2.2.1 Boats or craft. Packing is not applicable to this type delivery.

3.2.2.2.2 Accessories, spare and repair parts, tools and manuals. Packaged items shall be stowed in accordance with 3.1.5.3.

3.2.2.3 Boats or craft loading. Carrier loading is not applicable to type I, class 1 and 2 delivery (see 3.3).

3.2.3 Type II, class 1 and 2 delivery.3.2.3.1 Preservation.

3.2.3.1.1 Boat or craft. Each boat or craft shall be prepared for delivery in a manner which shall assure and provide protection against damage and which shall assure safe delivery of the boat or craft at destination. In addition, bilges shall be completely drained, steamed or water cleaned and dried. Bilge drain plugs shall be left open. Removed plugs shall be tagged (see 3.1.5.2) and shall be secured to the steering wheel by wire or in bags. The exterior of the boat shall be completely washed down with fresh water. Sea water systems shall be flushed with fresh water. Repainting and lubrication (see 3.1.6 and 3.1.7) shall be accomplished.

3.2.3.1.2 Accessories. Accessories such as rudders, masts, antennas, or other attached or demountable equipment which can create a boat or craft transportability problem shall be disassembled (see 3.1.5), prepared to the same delivery requirements as the boat or craft, and stowed (see 3.1.5.3).



## MIL-P-18147C(SH)

3.2.3.1.3 Spare and repair parts, tools and manuals. Preparation for shipment shall be as specified in 3.4.

3.2.3.2 Packing.

3.2.3.2.1 Boats or craft. Packing is not applicable.

3.2.3.2.2 Accessories, spare and repair parts, tools and manuals. Packaged items shall be stowed in accordance with 3.1.5.3.

3.2.3.3 Boat or craft loading. Carrier loading for type II, class 1 and 2 delivery shall be in accordance with 3.3.

3.2.4 Type III, class 1 and 2 delivery.

3.2.4.1 Preservation.

3.2.4.1.1 Boats or craft. Boats or craft shall be prepared in accordance with 3.1.6, 3.1.7 and 3.2.4.1.2. Bilges shall be completely drained, steamed or water cleaned and dried. Bilge drain plugs shall be left open. Removed plugs shall be tagged (see 3.1.5.2). The boat or craft exterior shall be completely washed down with fresh water. Sea water systems shall be flushed with fresh water.

3.2.4.1.2 Boat or craft systems and components. Boat or craft systems and components shall be as follows:

- (a) Batteries. Unless otherwise specified (see 6.2.1), batteries shall be shipped in their battery box or compartment. Connections to the batteries shall be disconnected. Terminals and leads shall be coated with a soft film, corrosion-resistant material covered with a waterproof, greaseproof, flexible material and secured from loss. Terminals and leads shall be tagged indicating terminal and lead polarity. Batteries shall be blocked or braced within the battery box or compartment to prevent movement and damage. Disconnected cables shall be arranged and secured to prevent damage to the cables and batteries. When batteries are removed from the battery box or compartment they shall be packaged dried, with acid packed separately in accordance with MIL-B-208.
- (b) Propellers. Propellers under 24 inches in diameter and those whose blades protrude lower than the keel line at propellers lowest projection shall be removed from the shafts. Propellers need not be removed when the boat or craft hull construction includes a skeg. Propellers larger than 24 inches in diameter and not protruding beyond the keel line need not be removed. Propellers removed or remaining installed on the shafts shall be protected with a preservative coating, in accordance with P-1 or P-19. Alternatively, propellers shall be coated with a water emulsion, sprayable, strippable protective coating. Unless otherwise specified (see 6.2.1),

## MIL-B-18147C(SH)

- propellers not removed from their shafts shall have the propeller blade edges protected by use of corrosion-resistant or treated metallic or non-metallic protectors. The protectors shall be positioned and secured to prevent their dislodgement and loss during boat or small craft handling, shipment and storage. Removed propellers shall be individually packed in a wood, plywood or fiberboard box in accordance with MIL-P-2845.
- (c) Shafts and hardware. Keys shall be coated with preservative in accordance with P-1 or P-19, replaced and secured from loss. Exposed shaft surfaces and attached propeller hardware shall be coated with P-1 or P-19. Contact preservatives shall not be applied to non-metallic such as rubber, fiberglass or similar covered surfaces.
  - (d) Water-jet unit. Unit shall be fresh water cleaned to assure removal of debris and foreign materials and dried. Unit preservation shall be accomplished by use of the normal operating lubricants assuring that bearings and control cable parts are thoroughly lubricated. Openings shall be sealed to prevent entrance of foreign materials. External unpainted corrodible surfaces, except cathodic protection material, shall be coated with a preservative (see 3.1.8). Damaged painted surfaces shall be repaired (see 3.1.6).
  - (e) Out-drive unit. The lubrication system shall be preserved in accordance with 3.2.4.1.2(h)(2). Bearings, shafts, controls and linkages shall be fully lubricated with the normal operating water-resistant grease. The cooling system including intakes shall be fresh water cleaned to assure freedom of debris, foreign material and intakes sealed. Propellers, shafts and hardware shall be preserved and packaged as specified in 3.2.4.1.2. Zinc rings and plates shall be new to assure maximum corrosion prevention. Bellows and hose clamps shall be properly positioned and tightened. Damaged hoses and bellows shall be replaced with new ones of like type and quality. Painted surfaces, if damaged, shall be repainted (see 3.1.6). Out-drive units shall be fully tilted in the up position and locked in position with its locking device.
  - (f) Sanitary systems. Equipment and piping shall be fresh water cleaned, drained of water, and system dried. Valves shall be left open. Folding basins and hinged equipment shall be secured against opening and movement.
  - (g) Tanks. Fuel tanks, drain tanks, expansion tanks, potable water tanks and sanitary water tanks shall be shipped dry. Connections to these tanks shall be open at the lowest point and the system completely drained or pumped dry. Waterproof tags indicating the necessity for reconnection or replacement of plugs before filling of tanks shall be attached to removed plugs and broken connections, closed or open valves, filling connections and to the steering wheel or steering wheel post at the helmsman's station. Openings to tanks involved in the fresh or drinking water system shall be reconnected after draining to prevent the entrance of insects and rodents and contamination of the system. Fuel tanks should be coated with a rust inhibitor.
  - (h) Power plant systems.



## MIL-B-18147C(SH)

- (1) Diesel and gasoline engines. Installed shipboard systems, basic unit including driven equipment, shall be cleaned and preserved in accordance with type III, method I of MIL-E-10062 to the extent specified herein. Manifolds, pumps, turbochargers and other attached accessories shall not be removed from the engine during cleaning and preservation unless the removal is essential for complete coverage with preservative. Gasoline engines shall have those requirements for diesel engines eliminated which are not applicable to gasoline engines.
- (2) Lubricating oil, fresh and sea water systems. Preservative, grade 30 in accordance with MIL-L-21260 shall be used throughout the engine and gear, fresh and sea water, and lubricating oil systems in lieu of the P-2, P-3, P-5, and P-9 preservative specified in MIL-E-10062. The preservative shall incorporate the maximum zinc content limit. Clean filter elements shall be installed in the lubricating oil systems after completion of preservation. In addition, the fresh water system, with thermostats removed, shall be drained and completely dried with dry, warm air prior to preservation. If it is impractical to perform a drying-out procedure, the cooling system shall be flushed with a soluble-oil, corrosion inhibitor material in accordance with MIL-I-24453, which will emulsify the water and remove it on draining. The system shall then be flushed with the specified preservative and the thermostat replaced. The preservative oil shall be drained from all systems including the crankcase.
- (3) Fuel oil system (diesel engines only). Preservative, viscosity grade 10W, in accordance with MIL-L-21260, shall be used throughout the fuel system. A substitute, satisfactory to the command or contracting activity, shall be used for those fuel systems where passages and orifices are so small as to prevent pumping of the preservative throughout the system. A mixture of four parts diesel fuel and one part grade 10 is satisfactory. Injectors shall not be removed from engines for the purpose of preservation. Clean filter elements shall be installed in the fuel system after completion of preservation.
- (4) Valve mechanism. Access covers shall be removed and surfaces within the valve compartment, including rocker mechanisms, valve stems, springs, guides, push rods and the inside surfaces of the cover plate shall be coated with viscosity grade 30 preservative in accordance with MIL-L-21260.
- (5) Tagging. Each engine shall be tagged stating: "The fluid systems of this engine preserved as follows: Preservative and break-in lubricating oil viscosity grade 30 for the lubrication, salt and fresh water systems and viscosity grade 10W for the fuel system. Preservative and break-in oil shall be in accordance with MIL-L-21260. Date engines preserved (month and year). Do not turn engine over until ready for use. No special engine depreservation required except for cooling system. Depreservation of cooling system and engine starting procedures shall be in accordance with NAVSEA S9086-AA-STM-000, chapters 233 and 583.

## MIL-B-18147C(SH)

- (6) Gas turbines. Unless otherwise specified (see 6.2.1), gas turbines shall be internally preserved in place with preservatives in accordance with MIL-E-5607. After the completion of internal preservation, all intake, exhaust or other turbine openings shall be sealed with greaseproof, water-vapor proof barrier material and secured in place with pressure-sensitive adhesive, greaseproof, waterproof tape. Alternatively, openings shall be sealed with blank flanges or plugs of corrosion-resistant material bolted or taped in place. Small openings shall be sealed with pressure-sensitive adhesive, waterproof tape or corrosion-resistant or treated plugs or caps.
- (i) Pumps and motors. Equipment shall be completely drained and preserved, except as specified herein, in accordance with MIL-P-16789.
  - (1) Manual bilge pumps. Pumps shall have handles compressed to their lowest position after preservation and secured to resist movement.
  - (2) Hydraulic systems.
    - a. Petroleum base fluid systems. Unless otherwise specified in the applicable equipment specification, pumps and motors shall be preserved in accordance with MIL-P-17869. Exposed threaded openings shall be closed with gasketed, corrosion-resistant or treated flat plates and bolted in place. A tag shall be affixed to the item stating: "The interior of this item is coated with corrosion preventive compound (brand name and type or MIL specification number), manufactured by (company name). Date pumps and motors preserved (month and year) and replacement shall be one year from above date, if still in storage."
    - b. Phosphate ester type fluid systems. Unless otherwise specified in the applicable equipment specification, pumps and motors shall be preserved with hydraulic fluid, fire resistant, in accordance with MIL-H-22072, with the addition of a vapor phase inhibitor as specified in MIL-I-22110. Closure of openings and tagging shall be as specified in 3.4.1.2(1)(2)(a), except the preservative replacement date shall state "two years" in lieu of "one year".
- (j) Drive belts, pulleys and sheaves. Drive belts shall be removed or released from tension. Pulley faces, grooves and sheave grooves shall be coated with a light coat of clear, air drying waterproofing varnish. When drive belts are not removed for shipment, strips of greaseproof, waterproof barrier material shall be placed between belts and pulleys after the air drying varnish has dried. Belts or pulleys shall be provided with a tag stating: "Remove barrier material prior to use". When drive belts are removed for shipment, they shall be wrapped either individually or in sets and unit packaged (see 3.4).

## MIL-B-18147C(SH)

## (k) Gears and housings.

- (1) Exposed gears. Exposed gears shall be coated with type P-1 or P-19 preservative.
- (2) Enclosed gears and housings. Transmissions attached to the boat power plant and which require lubrication for service use, when prepared for storage, shall be filled to the operating level with lubricating oil, to viscosity grade 30, in accordance with MIL-L-21260. Gears shall be actuated to ensure coating of interior parts and surfaces. The unit shall be tagged stating: "This housing is filled with preservative oil and is good for operation until the first required engine lubricant change". Equipment not attached to the boat power plant and lubricated from within their own housing shall be filled to the operating level with the applicable grade of multi-purpose lubricating oil as specified in MIL-L-2105, and operated without load for a sufficient length of time to ensure coverage of surfaces within the housing.

## (l) Clutches (not components of power plants).

- (1) Disk and shoe type. Clutch collars, pins, metal clutch facings and similar metal surfaces, when prepared for storage, shall be coated with a rust-inhibiting primer. Caution shall be exercised to assure that the primer application is minimized on composition facings. Brakes or clutches having all metal contact facings shall be set in the engaged position. Composition disk type clutches shall be blocked to a partially engaged position to eliminate contact between facing and pressure plate. The clutch shall not be blocked entirely open, since prolonged complete depression of clutch springs may cause a loss of elasticity in the springs. Snap-over center and toggle-in type clutches shall be completely disengaged.
- (2) Jaw type. Clutch jaws, shifter yoke and machined surfaces of shafts shall be coated with P-1 or P-19 preservative.
- (3) Clutch housings. Drain plugs, when provided, shall be removed from dry type housings. Plugs shall be identified and attached to the clutch control lever or some other conspicuous part of the clutch control mechanism. Threads of plugs and housing openings shall be coated with type P-1 or P-19 preservative. Clutch inspection plates and other openings shall be sealed. Levers and controls shall be secured to prevent their movement.
- (4) External adjusting mechanisms. Mechanisms, such as gear shift transfer or brake couplings, shall be coated with P-1 or P-19 where preservative removal is not required for operation. Where preservative removal is required for operation, an automotive type grease shall be used.

MIL-B-18147C(31)

- (m) Bearings, journals and journal boxes. Installed bearings or bearing parts, which have not been treated with a preservative in conjunction with other shipboard systems, shall be lubricated to capacity with the normal operating lubricant.
- (n) Electronic and electrical systems.
  - (1) Components not detached from basic equipment. Rotating components such as motors shall be protected in accordance with MIL-E-16298 or the alternate procedure herein, as applicable. Miscellaneous meters, switches, power distribution panels and similar devices which cannot be practically detached for separate unit protection shall be cleaned, lubricated as required for service, and sealed. Glass or glazing faces of devices shall be cushioned to prevent breakage.
  - (2) Components detached from basic equipment. Components such as motors, electrical brakes, control panels, regulators, switches detached or disassembled (see 3.1.5) shall be unit protected (see 3.4) and stowed aboard the craft (see 3.1.5).
  - (3) Wiring. Exposed ends of wires, openings, sockets, coupling plugs and terminals shall be sealed with pressure-sensitive adhesive, greaseproof, waterproof tape and coated with a clear, air-drying varnish. Care shall be taken not to contaminate conducting areas and mating parts.
  - (4) Electronic equipment to be delivered, not installed, shall be left in the manufacturers shipping container(s) and stowed in accordance with 3.1.5.
- (o) Galley equipment. Loose galley equipment shall be unit protected (see 3.4) and stowed aboard the boat or craft (see 3.1.5). Non-removable galley equipment shall have items, such as doors, secured against movement and sealed.
- (p) Firefighting systems.
  - (1) Fixed extinguishing systems. Fixed extinguishing systems shall be fully charged, mountings tight and secure, and cylinder valves closed. Fixed position nozzles shall be completely wrapped with clear plastic and then secure with pressure-sensitive adhesive, waterproof tape.
  - (2) Fire extinguishers. Openings to extinguishers shall be sealed and triggering devices secured to prevent activation. Portable extinguishers shall be removed, unit packed (see 3.4), and stowed below deck (see 3.1.5.3), whenever practicable.
- (q) Windshields and windows. Windshields, windows, glass and other glazing exposed to the elements and subject to subsequent damage, breakage and scratches, during shipment of the boat or craft by common carrier and which is destined for storage shall be covered with plywood having a minimum thickness of 5/16 inch. Plywood shall be in accordance with the U.S. Product Standard PS 1, grade CD, or equal, interior with exterior glue. Plywood shall

MIL-B-18147C(SH)

be securely fastened and seams, joints and edges sealed to prevent entrance of foreign material such as dust, dirt and liquids. If required, in order to install plywood covers, windshield wipers shall be removed, separately packaged (see 3.4), and stowed within the boat or craft (see 3.1.5).

- (r) Non-metallic boat or craft accessories. Accessories such as oars, canvas covers, life jackets, sails, cordage and bedding shall be clean, dry, and packaged (see 3.4). Packaging materials and stowage (see 3.1.5) shall be such to prevent mildew, infestation, and deterioration.
- (s) Deck mounted equipment. Equipment such as winches, capstans and deck fittings shall be lubricated as for service. Unpainted, untreated exterior surfaces subject to corrosion shall be coated with a protective preservative compound (see 3.1.8).
- (t) Cabin or compartment equipment. Items such as furniture, locker and cabinet doors, head and galley facilities, and tables shall be secured to prevent movement, opening and subsequent damage. Head and galley facilities shall be provided with covers to prevent accumulation of trash and damage to movable seats. Furniture seats shall be covered to prevent staining, deterioration and damage. Protective covers shall be securely fastened to prevent their loss.
- (u) Accessories. Accessories such as rudders, masts, antennas or other equipment or projections that can create a boat or craft transportability problem shall be disassembled (see 3.1.5), prepared to the same delivery requirements as the boat or craft and stowed (see 3.1.5). Guidance for the level of protection and preparation requirements for removed accessories, shall be in accordance with 3.4.
- (v) Spare and repair parts, tools and manuals. Preparation for shipment shall be in accordance with 3.4.

#### 3.2.4.2 Packing.

3.2.4.2.1 Boats or craft. Packing is not applicable.

3.2.4.2.2 Accessories, spare and repair parts, tools and manuals. Packaged items shall be stowed in accordance with 3.1.5.3.

3.2.4.3 Boats or craft loading. Carrier loading for type III, class 1 and 2 delivery shall be in accordance with 3.3.

#### 3.2.5 Type IV, class 1 and 2 delivery.

##### 3.2.5.1 Preservation.

3.2.5.1.1 Boats or craft. Each boat or craft shall be prepared for delivery in a manner which shall assure and provide protection against damage and which shall assure safe delivery at destination and as specified herein. Bilges shall be completely drained, steamed or water cleaned, and dried. Bilge drain plugs shall be left open. Removed plugs shall be tagged, marked and secured to or adjacent to the applicable drain. The tags and markings thereon shall be resistant to oil, water and fading. The exterior of the boat or craft including

MIL-B-18147C(5H)

interior of the sea water systems shall be cleaned with fresh water. Repainting and lubrication (see 3.1.6 and 3.1.7) shall be accomplished. In addition, the following requirements shall apply for the boat or craft systems:

- (a) Batteries. Unless otherwise specified (see 6.2.1), batteries shall be removed from their installed location, put into a dry condition, cleaned and terminal posts protected from corrosion. Removed batteries shall be unit packed (level B) and marked in accordance with MIL-B-208. The battery fluid shall be packaged in accordance with the Department of Transportation (DOT), Code of Federal Regulations (CFR), Title 49, parts 100 to 177.
- (b) Propellers. Propellers shall be removed from the shafts and stowed (see 3.1.5.3) within the boat or craft.
- (c) Hardware (see 3.2.4.1.2(c)).
- (d) Water-jet unit (see 3.2.4.1.2(d)).
- (e) Out-drive unit (see 3.2.4.1.2(e)).
- (f) Sanitary systems (see 3.2.4.1.2(f)).
- (g) Tanks (see 3.2.4.1.2(g)).
- (h) Power plant systems.
  - (1) Diesel and gasoline engines (see 3.2.4.1.2(h)(1)).
  - (2) Lube oil system (see 3.2.4.1.2(h)(2)).
  - (3) Fresh water system. The fresh water system shall be flushed, drained and preserved as specified in 3.2.1.
  - (4) Fuel oil system (see 3.2.4.1.2(h)(3)).
  - (5) Valve mechanism (see 3.2.4.1.2(h)(4)).
  - (6) Tagging. Each engine shall be tagged stating: "The fluid systems of this engine preserved as follows: Preservative and break-in lubrication oil viscosity grade 30 for the lube oil system, and viscosity grade 10 for the fuel oil system. Preservative and break-in oil in accordance with MIL-L-21260. Fresh water system preserved and protected against freezing (state temperature) and corrosion by use of anti-freeze and inhibitor. Salt water system is dry. Date engines preserved (month-year). Do not turn engines over until ready for use. No special engine depreservation required."
  - (7) Gas turbines (see 3.2.4.1.2(h)(6)).
- (i) Hydraulic systems (see 3.2.4.1.2(i)(2)).
- (j) Drive belts, pulleys, and sheaves (see 3.2.4.1.2(j)).
- (k) Gears and housings (see 3.2.4.1.2(k)).
- (l) Electric and electrical systems (see 3.2.4.1.2(n)).
- (m) Galley equipment. Loose galley equipment shall be unit protected and stowed (see 3.2.4.1.2(o)). Non-removable galley equipment shall have items such as doors secured against movement and sealed.
- (n) Fire extinguishing systems (see 3.2.4.1.2(p)(1)).
- (o) Windshields and windows (see 3.2.4.1.2(q)).
- (p) Non-metallic boat or craft accessories (see 3.2.4.1.2(r)).
- (q) Deck mounted equipment (see 3.2.4.1.2(s)).
- (r) Cabin or compartment equipment (see 3.2.4.1.2(t)).



## MIL-B-18147C(SH)

3.2.5.1.2 Accessories. Accessories such as rudders, masts, antennas or other attached or demountable equipment which can create a boat or craft transportability problem shall be disassembled (see 3.1.5), prepared to the same delivery requirements as the boat or craft and stowed.

3.2.5.1.3 Spare and repair parts, tools and manuals (see 3.4).

3.2.5.2 Packing.

3.2.5.2.1 Boats and small craft. Packing is not applicable.

3.2.5.2.2 Accessories, spare and repair parts, tools and manuals. Items shall be stowed in accordance with 3.1.5.3.

3.2.5.3 Boat or craft loading. Carrier loading for type IV, class 1 and 2 delivery shall be in accordance with 3.3.3.

3.3 Loading. Open type boats or craft having topside openings such as compartments shall be provided with flexible (canvas or flexible reinforced plastic) or rigid covering, to prevent entrance of foreign material and pilferage during handling, shipment and storage. Flexible covers shall be treated for protection against deterioration from exposure to the elements and supported by structural members to prevent their collapse and damage due to wind or accumulation of rain or snow. Rigid covers shall be resistant to corrosion, inherent or treated and provide waterproof protection. Plywood, if used, shall be of minimum 3/8-inch thickness and as specified in 3.2.4.1.2(q). Plywood covers shall be provided with additional structural members, where required, to support the weight (approximately 200 pounds) of an individual. Covers shall be secured to prevent loosening, detaching, loss and becoming an operational safety hazard during boat handling, shipment and storage. Rigid covers shall be provided for type II and IV shipments.

3.3.1 Loading details. When specified (see 6.2.1), the contractor shall develop prior to carrier loading and shipment, complete descriptive details on drawings of the carrier loading procedure for review and acceptance (see 6.2.2).

3.3.2 Type I, class 1 and 2 delivery.

3.3.2.1 Boats or crafts. Carrier loading is not applicable to this type and class delivery.

3.3.3 Type II, III and IV, class 1 and 2 delivery.

3.3.3.1 Boats or crafts. Carrier loading shall be in accordance with 3.3.3.1.1, 3.3.3.1.2, 3.3.3.1.3, 3.3.3.1.4 and 3.3.3.1.5, as applicable.

3.3.3.1.1 Rail, open top cars. Loading shall be in accordance with section 6, of the Association of American Railroads. Cradles, as required by the individual boat or craft specification or acquisition document, shall be contractor furnished and will be acceptable for the boat or craft shipment when certified (see 6.2.2) that such complies with the requirements specified herein and the carrier rules. When cradle requirements are not specified in the individual detail boat or craft specification or acquisition document, the contractor

MIL-B-18147C(SH)

shall assure that the snipping ~~cradle satisfies the requirements~~ specified herein and such will provide safe transportation of the boat or craft to its destination. Cradles shall be designed to a minimum 2.5 safety factor. Cradles shall provide full keel support. Cushioning shall be provided between the cradle and the boat or craft hull. The boat or craft towing pad eyes or similar accessories shall not be used. Natural ventilation ventilators shall remain open to permit air circulation continuance, but shall be screened to prevent the entrance of insects and rodents. Boats or craft that are loaded on their sides or tilted for shipment shall have the installed power plants blocked, braced or shored, as applicable, to prevent side loading on the engine's foundations.

3.3.3.1.2 Rail, closed cars. Loading shall be in accordance with the requirements of the Association of American Railroads pamphlet no. 14, and circular no. 42-G. Cradles and cradling shall be in accordance with 3.3.3.1.1.

3.3.3.1.3 Truck. Loading shall be in accordance with 3.3.3.1.1 including the requirements of the applicable carrier.

3.3.3.1.4 Transporter (trailers or cradles). When required (see 6.2.1), special designed boat or craft transporters and a packaging, handling, storage and transportability (PHST) plan in accordance with the requirements of MIL-STD-1367, shall be as specified in the individual boat or craft detail specification or acquisition document. The contractor shall develop transporter data and drawings (see 6.2.1), unless otherwise specified in the detail boat or craft specification or acquisition documents.

3.3.3.1.5 Vessel. Loading shall be in a manner which will assure safe delivery of the boat or craft and contents at destination. Cradles and cradling (see 3.3.3.1.1), anchoring, blocking, bracing, shoring, cushioning, as applicable, and waterproofing for vessel top-side loading shall be provided. Procedures shall, as a minimum, be in accordance with the applicable carrier requirements and the regulations, as applicable, governing cargo shipment on inland waterway or ocean going vessels.

#### 3.4 Accessories, spare and repair parts, tools and manuals.

3.4.1 Accessories, spare and repair parts and tools. Accessories, spare and repair parts and tools shall be preserved (unit protected or preserved-packaged), packed and marked to meet the levels of protection specified herein in accordance with MIL-R-195, MIL-E-17555 or MIL-STD-1188. For levels A, B and C preservation and packing MIL-R-196 and MIL-E-17555 apply. For commercial or industrial preservation and packing MIL-STD-1188 applies. Preservation with transparent materials shall be in accordance with MIL-STD-758. For material not covered by the foregoing specifications, level A preservation shall be in accordance with MIL-P-116 and packing (shipping containers) in accordance with MIL-E-17555. Selection of the level of protection for the material intended use and destination shall be as specified (see 6.2.1) in accordance with the following:

## MIL-B-18147C(SH)

<u>Use or destination</u>	<u>Preservation</u>	<u>Packing</u>
On board	A	C, commercial or industrial
Stock	A	A, (overseas shipment) B, (domestic shipment)
Immediate use	C, commercial or industrial	C, commercial or industrial

3.4.1.1 Unit pack quantity. Unless otherwise specified (see 6.2.1), material shall be unit protected one per unit pack except that all parts comprising a single set or assembly shall be individually unit protected within a unit pack. When unit packed as a set, assembly, or quantity greater than one, each item shall be wrapped or cushioned (see 3.1.4) to prevent damage from direct surface contact with the surfaces of adjacent items.

3.4.1.2 Material arrangement in containers. Arrangement within the containers shall be in a compact, non-shifting manner. Cushioning and wrapping materials shall conform to 3.1.4.

3.4.2 Manuals, drawings and other data. Manuals, drawings and other data which accompany shipments shall be unit packed in transparent, waterproof plastic bags, minimum 4 mil thick. Bag closure shall be by heat sealing. When the shipment consists of more than one pack (shipping container), the technical literature shall be placed in the number one container. Technical literature shall not be placed within any sealed flexible barrier material used to enclose the item. For equipment in multiple shipping containers, the technical literature shall be placed within the shipping container housing the main unit. Packing lists (see 6.2.2) shall indicate which container encloses the technical literature and shall also state the approximate location therein. Technical manuals when shipped in bulk quantities shall be prepared for delivery or packaged in accordance with the requirements of the applicable technical manual specification.

3.5 Instructions. The following instructions shall be provided (see 6.2.2). Instructions, paper and printing, shall be non-fading, water and greaseproof. Printing shall be clean and legible. Two copies of instructions shall be contained in a transparent plastic bag or envelope with a press-fit type or heat-sealed closure. The instruction's unit pack shall be clearly marked "DEPRESERVATION AND REACTIVATION INSTRUCTIONS. DO NOT RUN CRAFT PRIOR TO ACCOMPLISHMENT", and secured to the steering wheel or steering wheel post.

3.5.1 Depreservation and reactivation. The instructions shall provide specific direction for the boat or craft depreservation prior to service, and its reactivation for service. Instructions shall accompany each boat or craft prepared for type II, III, and IV delivery. The instructions may vary, but as a minimum shall contain requirements covering the following:

- (a) Replacement of removed plugs such as, bilge drains and tanks.
- (b) Reconnection of broken connections to water and fuel tanks and batteries.
- (c) Reassembly and reinstallation of disassembled equipments such as antennas, searchlights, rudders, propellers, electronic and electrical and other equipment removed for shipment.

## MIL-B-18147C(SH)

- (d) Removal of opening closures, seals, and tape from assemblies and accessories such as air cleaners, battery caps, breathers, belts, rotating units (motors, generators), instrument panels, switch boxes, vents and fire extinguishing systems.
- (e) Battery charging.
- (f) Lubricating oil for power plant crankcase, gearing and drive unit.
- (g) Fresh water system depreservation.
- (h) Engine starting and run-in.

3.6 Marking. In addition to any special marking required (see 6.2.1), unit and exterior (shipping) packs, and unpacked boats shall be marked in accordance with MIL-STD-129, level A for storage. For immediate use requirements, marking shall be in accordance with MIL-STD-1188.

3.7 Workmanship. Workmanship shall be such that, when the proper procedure is followed, materials, equipments, systems, and boats or craft processed, shall be protected against corrosion, deterioration, and damage during handling, shipment and storage.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

##### 4.2 Quality conformance inspection.

4.2.1 Boats or craft. Each boat or craft shall be inspected in accordance with the applicable requirements of this specification for the type of delivery specified in the acquisitioning document.

4.2.2 Accessories, parts, tools and manuals. Sample packaged items shall be selected and inspected in accordance with the quality assurance requirements of the applicable referenced specification. Material not covered by referenced specification, sample packages shall be selected and inspected in accordance with the quality assurance requirements as specified in MIL-P-116. Material destined for immediate use, sample packages shall be selected and inspected in accordance with and assure compliance with the contractor's commercial or industrial practice for the furnished product.

#### 5. PACKAGING

This section is not applicable to this specification. Packaging requirements are specified in section 3 herein.

## MIL-B-18147C(SH)

## 6. NOTES

6.1 Intended use. The preparation for delivery requirements specified herein are intended to assure proper and safe delivery, storage, stowage and transportation of boats and craft for direct shipment to Government activities; craft processed at a military activity, and for preparing requirements in specifications and acquisition documents.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type and class of delivery required (see 1.2).
- (c) When boat or craft and equipment disassembly is required (see 3.1.5.1).
- (d) When batteries will not be shipped in their box or compartment (see 3.2.4.1.2).
- (e) When propeller blade edges protection is not required (see 3.2.4.1.2).
- (f) Gas turbine preservation is other than specified (see 3.2.4.1.2).
- (g) When batteries will not be removed (see 3.2.5.1.1).
- (h) Drawings if other than level 2 (see 3.3.1).
- (i) Loading procedure (see 3.3.1).
- (j) When a PHST plan is applicable (see 3.3.3.1.4).
- (k) When a special designed transporter is required (see 3.3.3.1.4).
- (l) Level of protection required (see 3.4.1).
- (m) Unit pack is other than specified (see 3.4.1.1).
- (n) Special marking required (see 3.6).

6.2.2 Data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL), the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of DAR 7-104.9 (n)(2) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification is cited in the following paragraphs.

<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
3.1.2.1, 3.1.3.3 and 3.3.3.1.1,	Certificate of compliance	DI-E-2121	----
3.3.1 and 3.3.3.1.4	Drawings, engineering and associated lists	DI-E-7031	Level 2 Drawing number - contractor Design designation - contractor

MIL-B-18147C(SH)

<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
3.3.3.1.4	Packaging and transportation support data	UDI-P-23508	----
3.4.2	Packing list(s)	UDI-L-20500	----
3.5	Documentation, management/technical support	UDI-A-26199	----

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5000.19L., Vol. II, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the same Government agency under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3 Definitions or explanation of terms. For definitions or explanation of terms not specified herein, ANSI MH 15.1 and ASTM D 996 shall apply.

6.3.1 Exterior pack. Exterior pack is a container, bundle, or assembly which is sufficient by reason of material, design and construction to protect material during shipment and storage. This can be the unit pack or a container with any combination of unit or intermediate packs.

6.3.2 Marking. Marking is the application of numbers, letters, labels, tags, symbols or colors for material handling or identification during shipment and storage.

6.3.3 Packaging. Packaging is the methods and materials used to protect material from deterioration or damage. This includes cleaning, drying, preserving, packing, marking and unitization.

6.3.4 Packing. Packing is assembling of items into a unit, intermediate or exterior pack with necessary blocking, bracing, cushioning, weatherproofing, reinforcement and marking.

6.3.5 Preservation. Preservation is the application of protective measures, including cleaning, drying, preservative materials, barrier materials, cushioning, and containers when necessary.

6.3.6 Support items. Support items are subordinate to, or associated with, an end item (such as, spares, repair parts, tools, test equipment, support equipment and sundry materials) and required to operate, service, repair or overhaul an end item.



MIL-B-18147C(SH)

6.3.7 Repair part. Repair parts are those support items coded to be not repairable (such as consumable items).

6.3.8 Spare. Spares are those support items coded to be repairable (such as repairable item).

6.3.9 Unit pack. Unit pack is the first tie, wrap, or container applied to a single item or quantity thereof, or to a group of items of a single stock number, preserved or unpreserved, which constitute a complete or identifiable package.

6.4 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Preparing activity:  
Navy - SH  
(Project 1990-N042)