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SUPERSEDING

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MILITARY SPECIFICATION**LIFE RAFTS, INFLATABLE - 4 AND 7 MAN - FOR AIRCRAFT USE**

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for one type of a four-man inflatable life raft and two types of a seven-man inflatable life rafts.

1.2 Classification. The life rafts shall be of the following types, as specified (see 6.2.1b).

LRU-12/A	Four-man life raft
LRU-1/P	Seven-man life raft
LRU-13/A	Seven-man life raft

2. APPLICABLE DOCUMENTS**2.1 Government documents.**

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks 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**FEDERAL**

L-S-00626 Sponge, Synthetic

FF-O-605 Opener, Can, Hand (Disposable, Combination Opener and Punch)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Engineering Specifications and Standards Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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SPECIFICATIONS (Continued)

FEDERAL (Continued)

UU-T-81	Tag, Shipping and Stock
PPP-B-636	Boxes, Shipping, Fiberboard
PPP-C-843	Cushioning Material, Cellulosic
PPP-T-76	Tape, Packaging, Paper (for Carton Sealing)
PPP-T-97	Tape, Pressure-Sensitive Adhesive, Filament Reinforced

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MIL-B-18/224	Battery, Dry, BA-1328/U
MIL-P-116	Preservation-Packaging, Methods of
MIL-K-818	Knife, Pocket, General Purpose
MIL-W-1053	Whistle, Ball, Plastic
MIL-C-5040	Cord, Nylon
MIL-A-5540	Adhesive, Polychloroprene
MIL-P-8258	Pumps, Hand, Air
MIL-B-8571	Bag, Storage, Drinking Water
MIL-S-11262	Sunburn Prevention Preparation (Cream, Paste and Lotion)
MIL-W-15117	Water, Drinking, Canned, Emergency
MIL-F-15381	Food Packet, Survival, Aircraft Life Raft
MIL-R-17343	Rope, Nylon
MIL-S-17980	Sea Marker Packet, Inflatable Survival Equipment
MIL-I-18369	Inflation Equipment, Carbon Dioxide for Multiplace Life Rafts
MIL-M-18371	Mirror, Emergency Signaling, Mark 3
MIL-C-23070	Cloth, Laminated, and Tape, Coated Cloth, Polyisoprene, Natural or Synthetic, Rubber on Nylon
MIL-L-23614	Light, Marker, Distress, Aircrew, SDU-30

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SPECIFICATIONS (Continued)

MILITARY (Continued)

MIL-B-36964 Blanket, Combat, Casualty, Lightweight, Water-proof, Aluminized Plastic

MIL-L-38217 Light, Marker, Distress, SDU-5/E

STANDARDS

FEDERAL

FED-STD-191 Textile Test Methods

FED-STD-595 Colors

FED-STD-601 Rubber, Sampling and Testing

FED-STD-751 Stitches, Seams and Stitching

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MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-129 Marking for Shipment and Storage

MIL-STD-130 Identification Marking of U. S. Military Property

MIL-STD-794 Parts and Equipment, Procedures for Packaging and Packing of

MS22054 Valve, Life Raft, Flush Type, Topping-Off

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

CODE OF FEDERAL REGULATIONS

49 CFR 100-199 Regulations for the Transportation of Explosives and Other Dangerous Articles

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

DRAWINGS

NAVAL AIR DEVELOPMENT CENTER

CL230D1 Life Raft and Equipment Assemblies - Multiplace

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DRAWINGS (Continued)

NAVAL AIR SYSTEMS COMMAND

62A82H1	LRU-12/A Inflatable Life Raft Assembly
62A82H2	LRU-13/A and LRU-1/P Inflatable Life Raft Assembly, 7 Man
62A82H3	Details, LRU-12/A and LRU-13/A Life Rafts
62A82H5	Carrying Case Assembly, LRU-12/A Life Raft, 4 Man
62A82H6	Carrying Case Assembly, LRU-1/P Life Raft, 7 Man
62A82D7	Accessory Container Assembly, LRU-12/A and LRU-13/A Life Rafts
62A82D12	Folding Procedure, LRU-12/A Life Raft, 4 Man
62A82D13	Folding Procedure, LRU-13/A and LRU-1/P Life Raft, 7 Man
63A120H1	Inflation Equipment, Carbon Dioxide, for Multiplace Life Rafts

AIR FORCE

55C3689	Cylinder and Valve Assembly, Carbon Dioxide, Multiplace Life Raft
62D4339	Cover-Valve, Carbon Dioxide, LRU-1/P Life Raft, Assembly of

PUBLICATIONS

NAVAL AIR SYSTEMS COMMAND

NAVAIR 13-1-6.1	Aviation Crew Systems Manual Inflatable Survival Equipment
NAVAIR 00-25-513	Code Card

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers 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.

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NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT

National Motor Freight Classification

(Application for copies should be addressed to the National Motor Freight Traffic, Tariff Department, 1616 P Street, N.W., Washington, DC 20036.)

UNIFORM CLASSIFICATION COMMITTEE, AGENT

Uniform Freight Classification Rules

(Application for copies should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

(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 Qualification. The life rafts furnished under this specification shall be a product which has been inspected and has passed the qualification inspections specified herein, and has been listed on or approved for listing on the applicable Qualified Products List (see 4.3 and 6.3). Qualification of any one type of the life rafts in this specification will qualify a supplier for the three types specified herein.

3.2 First article. When specified, samples shall be subjected to first article inspection (see 4.4 and 6.4).

3.3 Materials and components. Materials and components shall conform to applicable specifications, standards and drawings as listed or required herein (see 6.2.11). Materials and components which are not covered by applicable specifications, standards or drawings, or are not specifically described herein shall be of the best quality, of the lightest practicable weight, and entirely suitable for the purpose intended. Unless otherwise specified, the materials and components, except for the metallic parts (excluding the carbon dioxide cylinder), used in the construction of the life raft shall have been manufactured not more than 18 months prior to the date of delivery of the life raft (see 6.2.11(2)).

3.4 Design. The LRU-12/A, LRU-1/P and LRU-13/A life rafts shall consist of an encircling buoyant tube with a floor attached, an inflatable seat manually inflated through the topping-off valve, an outer encircling life line, a sea anchor, three boarding handles, three righting handles on the underside of the floor, two topping-off valves in

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the raft inflatable tube, a carbon dioxide inflation system (not applicable to LRU-1/P, unless specified in the acquisition document (see 6.2.1m) and a carrying case, supply pocket and an accessory container. The size, shape and arrangement of the life rafts and the components shall conform to Drawings CL230D1, 62A82H1 and 62A82H2, as applicable.

3.5 Construction.

3.5.1 Cut edges. All the cut edges of the uncoated nylon fibrous materials, except for the base cloths which are to be coated, shall be seared prior to the fabrication of the life raft to prevent fraying. No sharp edges shall be formed.

3.5.2 Use of the adhesive. In all the cementing operations, the surface to which the adhesive is to be applied shall be thoroughly cleaned with a suitable solvent in such a manner that the dusting materials (zinc stearate or talc) and any other surface contaminant is removed. The surface shall be clean prior to cementing. Care should be exercised to insure that the coating and the base undercloth are not damaged and the adhesion between both is not impaired in any way by prolonged exposure to the solvent. The solvent used shall evaporate completely prior to the application of the adhesive and shall leave no residue. Cemented areas shall be rolled out and all trapped air, channels, and wrinkles removed. The adhesive shall be controlled to insure that old adhesive or adhesive which has partly or completely polymerized is not used. A fresh batch of the adhesive shall be used at least every eight hours during the course of manufacture. Containers for the adhesive shall be free from congealed adhesive before being refilled.

3.5.3 Cementing of the seams, seam tapes, patches and attachments. The construction of the seams and sealing areas and the attaching of the seam tapes, patches, and attachments shall be undertaken utilizing the technique and precautions outlined in 3.5.2 so that, prior to the inspection of the assembled life raft, the adhesive shall have developed its optimum bonding properties and the adherence of all such seams, sealed areas, seam tapes, patches and attachments shall comply with the requirements of this specification. All the seams, seam tapes, patches, sealed areas, and the attachments shall be secured by the adhesive specified in the applicable drawings. The seams shall be covered on the inner and outer sides with seam tape as specified in the applicable drawings. All the seam tapes shall be applied to seams without tension and shall be applied so that a minimum of 3/8 inch is on either side of the seam edge which it covers. All the patches and attachments shall be cemented to the life raft without tension. The adhesive shall be applied in a straight line parallel to the edges of the seam tapes, seams, patches and attachments and shall extend from just being visible to a maximum of 1 inch beyond the edges of the seam tape, seam, patch and attachment. The seam tapes, which seal circumferential seams, or where one end of the seam tape comes in contact with the other end of the same seam tape or another seam tape, shall overlap on itself, at the ends, 3/4, plus 1/2, minus 0 inch. The overlap for the cemented seams shall be in accordance with the applicable drawings. The adhesive,

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when dry or cured, shall present a neat and uniform appearance. The adhesive shall not be allowed to remain in clots not permitted to extend in such a manner as to result in localized stiffness. The adhesive, upon or during drying shall not cause the cloth, seam tapes and attachments to shrink or pucker at any point on the life raft. The life raft shall be free from congealed masses of the adhesive and spots or stains resulting from excessive adhesive.

3.5.4 Seams and stitching. No stitching shall be used in any of the life raft seams, through the cloth of any air retaining chamber, or through the life raft floor. Sewing may only be used in the construction of the accessory parts but not in their final attachment to the life raft. All the machine stitching in the accessory parts shall be accomplished as specified in the application specification and drawing. All the sewing, except for the bartacks (see 3.5.4.2), shall be accomplished with stitch type 301, conforming to FED-STD-751, and shall contain 6 to 10 stitches per inch. Each row of stitching shall be straight and parallel to the seam edge. The ends of the stitching shall be backstitched, by overlapping on itself, a minimum of 1/2 inch. Thread breaks, skips and run-offs shall be overstitched not less than one inch. The thread tension shall be maintained so that there shall not be any loose or tight stitching and the lock shall be embedded in the materials sewn together. No seam shall be twisted, puckered or pleated and no portion of the accessory parts shall be caught in an unrelated operation or seam. All the thread ends shall be trimmed to a length of 1/4 inch maximum. The seam edges shall be properly forced out and shall not contain any folds.

3.5.4.1 Cross over seams. A three-inch disc of the laminated cloth conforming to MIL-C-23070, variety C, shall be centered and securely cemented over each cross over seam on the inner side of the buoyancy chamber, as in Drawings 62A82H1 or 62A82H2, as applicable. The disc shall be cemented and shall have the same resulting properties as described in 3.5.3.

3.5.4.2 Bartacking. The number of stitches per bartack shall be based proportionally on a 7/8-inch long bartack containing a minimum of 49 stitches. The length and location of each bartack shall be as specified in the applicable specifications or drawings.

3.5.5 Construction details. The construction details for each four and seven man inflatable life raft shall conform to the applicable specifications and drawings.

3.5.5.1 Inflatable tube. The cloth sections used in the raft flotation tube shall be incorporated in such a manner that the warp threads of the straight cloth run in a circumferential direction around the tube and the warp threads of the bias cloth run in the opposite direction in the adjoining sections. The floor shall be attached to the flotation tube without tension and with sufficient slack to prevent distortion of the tube, when the raft is inflated. The floor shall be attached in such a manner to extend past the center line of the inflatable tube as specified in Drawings 62A82H1 and 62A82H2, as applicable.

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3.5.5.2 Bulkheads. Two internal vertical bulkheads shall be installed on each life raft so as to divide the flotation tube into two separate compartments. The bulkheads shall be constructed, located and attached to the inside of the tubes as specified in the applicable drawings.

3.5.5.3 Inflatable seat. Each life raft shall have an inflatable seat fabricated from the laminated cloth conforming to MIL-C-23070, variety C. The inflatable seat shall be circular and the ends shall be tailored to fit the curvature of the inflatable tube. The inflatable seat shall be an independent air chamber, prior to the installation onto the life raft, and shall be capable of being manually inflated through the topping-off valve conforming to MS22054. The entire area of contact between the ends of the seat and the flotation tube shall be cemented together and reinforced as specified in Drawings 62A82H1 or 62A82H2, as applicable.

3.5.6 Inflation system.

3.5.6.1 Manual. The inflatable tube shall contain two topping-off valves conforming to MS22054 for the manual inflation of the life rafts. The topping-off valves shall be installed on the same side of the life raft, one on each side of the bulkhead, in accordance with Drawings 62A82H1 or 62A82H2, as applicable.

3.5.6.2 Carbon dioxide.

3.5.6.2.1 LRU-12/A and LRU-13/A rafts. The carbon dioxide inflation system for the LRU-12/A and LRU-13/A rafts shall conform to MIL-I-18369, Drawings 63A120H1, 62A82H1 and 62A82H2, as applicable.

3.5.6.2.2 LRU-1/P rafts. When the carbon dioxide inflation is required by the acquisition (see 6.2.1m), the cylinder assembly of the carbon dioxide inflation system for the LRU-1/P rafts shall conform to Drawing 55C3689. The inlet manifold shall conform to MIL-I-18369 and Drawing 63A120H1.

3.5.6.2.3 Location and attaching of the carbon dioxide inflation system. The carbon dioxide inflation system shall be located and attached to the rafts as in Drawings 62A82H1 and 62A82H2, as applicable. The inlet manifold hose, when attached to the carbon dioxide cylinder valve, shall not contain any bends or folds so that the entire length shall be utilized.

3.5.6.2.4 Diffusion of the carbon dioxide entering the raft inflatable tube chamber. The carbon dioxide entering the raft inflatable tube chamber through the manifold shall be again diffused by a deflector to lessen the accumulation of the solid carbon dioxide at the nearest tube fold line. The deflector shall not interfere with the normal operation of the life raft.

3.5.6.3 Protective coverings.

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3.5.6.3.1 LRU-12/A and LRU-13/A rafts. Each LRU-12/A and LRU-13/A raft shall contain the protective coverings for the carbon dioxide cylinder valve and the pull cable and housing assembly sleeve. The protective coverings shall be fabricated as in Drawing 62A82H3 and shall be located and attached as in Drawings 62A82H1 and 62A82H2, as applicable.

3.5.6.3.2 LRU-1/P rafts. Each LRU-1/P life raft shall be provided with a carbon dioxide valve cover conforming to Drawing 62D4339. The valve cover shall be stowed in the supply pocket.

3.5.7 Attachments. The attachments and components of the LRU-12/A, LRU-13/A and LRU-1/P life rafts shall be located and cemented to the life rafts as specified in Drawings 62A82H1 and 62A82H2, as applicable.

3.5.8 Survival equipment. The survival equipment, type and quantity, as listed in table VII, shall be supplied only for initial aircraft outfitting, when specified (see 6.2.lj and 6.2.lk).

3.6 Dimensions. The dimensions of each four and seven man inflatable life raft and of each inflatable section shall conform to the applicable drawings when the raft and sections are inflated to a pressure of one pound per square inch.

3.7 Color. The color of the four and seven man inflatable life rafts and patches shall be as specified in the applicable drawings. Unless otherwise specified, the color of the thread, rope, cord and uncoated tape and webbing shall be natural (white).

3.8 Markings. Markings shall be in accordance with MIL-STD-130. Ink color, size and locations shall be as specified on applicable drawings. Letters and numerals 1/4 inch or less in height shall not be stenciled. Serial numbers shall be assigned by the acquiring activity (see 4.5.1.2 and 6.2.le). Markings shall be thoroughly dry before packing.

3.8.1 Cylinder. In addition to the markings required by MIL-STD-130, the carbon dioxide filled cylinder shall be weighed and marked (stenciled) with 1/2 inch black letters and numerals consisting of the following (see 4.7.6.1):

a. Tare weight (empty cylinder, valve, cable and cable housing).

b. Weight of carbon dioxide charge.

c. Gross weight (tare weight plus charge).

3.8.1.1 Cylinder warning. The carbon dioxide filled cylinder shall be marked with the following information in 1 inch red letters:

WARNING - COMPRESSED GAS - DO NOT DROP

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3.9 Performance inspections.3.9.1 Topping-off valve.

3.9.1.1 Flange adhesion to the spool. The molded rubber flange on the topping-off valve shall not strip away from the brass spool of the topping-off valve nor shall the rubber flange fall below 75 pounds, when inspected as specified in 4.7.1.

3.9.1.2 Strength of attachment to the inflatable tube and seat. The attachment of the topping-off valves and also the manifold, life line patches, boarding and righting handles, and carrying case handles shall withstand a pull of 250 pounds when inspected as specified in 4.7.8. The sea anchor patch shall withstand a pull of 400 pounds.

3.9.2 Strength of the seam.

3.9.2.1 Seam breaking strength. All the untaped seams shall have a minimum breaking strength of 150 pounds per inch in width, when inspected as specified in 4.7.9.1.

3.9.2.2 Seam separation. All the untaped seams shall not separate, when inspected as specified in 4.7.9.2.

3.9.3 Operation (carbon dioxide). Each life raft, when inspected for operation as specified in 4.7.3, shall inflate to its design shape in not more than 30 seconds. The pressure in the bow and stern compartments shall be not less than one psig nor more than 2 psig. The difference in pressure between the bow and stern compartments shall be not more than 0.50 pounds per square inch gage (psig). All the seams, sealed areas and cemented attachments shall remain perfectly intact and shall show no indication of separation. There shall be no evidence of constructional or material failure in any respect. The life raft bottom and flotation tube shall not be twisted or distorted and there shall not be a difference in the rise between the sides. Each topping-off valve shall operate without difficulty, shall shut off securely, and shall not be blocked by excess adhesive, talc, zinc stearate or other foreign materials. This examination and test shall be performed in sequence with the pressure inspections. The operation inspection shall be performed first and when completed the raft inflatable tube shall be completely deflated and the life raft then inspected for conformance to the requirements of 3.9.4 through 3.9.4.2.

3.9.4 Pressure. The pressure inspection shall be performed in sequence with the leakage inspection. The pressure inspections shall be performed first and when completed, the raft inflatable tube and the inflatable seat shall be completely deflated before the life raft is inspected for conformance to the requirements of 3.9.5 through 3.9.5.2.

3.9.4.1 Raft inflatable tubes. The pressure in the raft inflatable tube shall be not less than 4.75 psig, when inspected as specified in 4.7.4. All the seams, sealed areas and cemented attachments shall remain perfectly intact and shall show no evidence of constructional

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or material failure in any respect. The life raft bottom and flotation tube shall not be twisted or distorted and there shall not be a difference in the rise between the sides. Each topping-off valve shall operate without difficulty, shall shut off securely, and shall not be blocked by any excess adhesive, talc, zinc stearate or other foreign matter.

3.9.4.2 Inflatable seat. The pressure in the inflatable seat shall be not less than 1.75 psig, when inspected as specified in 4.7.4. All the seams, sealed areas and cemented attachments shall remain perfectly intact and shall show no indication of separation. There shall be no evidence of constructional or material failure in any respect. The topping-off valve shall operate without difficulty, shall shut off securely, and shall not be blocked by any excess adhesive, talc, zinc stearate or other foreign matter.

3.9.5 Leakage.

3.9.5.1 Raft inflatable tube. The pressure in the raft inflatable tube shall be not less than 1.60 psig, when inspected as specified in 4.7.5.

3.9.5.2 Inflatable seat. The pressure in the inflatable seat shall be not less than 0.60 psig, when inspected as specified in 4.7.5.

3.9.6 Weight of raft. The maximum weight of the raft, including the carrying case, accessory container, supply pocket and carbon dioxide inflation assembly (cylinder, valve, pull cable, housing assembly and retaining line), shall be as follows (see 4.7.6):

<u>Raft type</u>	<u>Weight, pounds maximum</u>
LRU-12/A	42
LRU-1/P	52
LRU-13/A	52

3.9.7 Extreme temperatures. When inspected as specified in 4.7.7.1 and 4.7.7.2, the raft shall inflate without any hindrance to the flow of the carbon dioxide or restriction by any component and shall have rounded into its design shape, as shown in the applicable drawing, within 15 minutes. All the seams, sealed areas and cemented attachments shall remain perfectly intact and shall show no indication of separation. There shall be no evidence of constructional or material failure in any respect. The life raft bottom and flotation tube shall not be twisted or distorted and there shall not be any difference in the rise between the sides. The raft inflatable tube shall be completely deflated and the life raft shall then be inspected and conform to the requirements for leakage, 3.9.5 through 3.9.5.2.

3.10 Packing of the raft in the carrying case.

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3.10.1 Accessories. The sea anchor and the accessory container shall be stowed as specified in Drawings 62A82D12 and 62A82D13, as applicable. When the carbon dioxide inflation assembly is a required component of the acquisition, the carbon dioxide filled cylinder, valve, cylinder valve protector, pull cable housing and retaining line shall be packaged within a fiberboard container conforming to PPP-B-636. Closure of the container shall be in accordance with the appendix to PPP-B-636. The supply pocket shall be fully zippered. The snap hook of the retaining line shall be inserted through the loop at the end of the retaining line. The loop thus formed shall be placed around the neck of the carbon dioxide filled cylinder, as in Drawings 62A82H1 and 62A82H2, as applicable, and shall be drawn tight.

3.10.2 Protection. The accessory and survival equipment, as applicable, shall be placed in their respective containers, as specified in 3.10.1, in such a manner as to afford adequate protection against damage to themselves, to the containers or to the raft. All the rigid parts such as valves, cylinders, hardware and all the other metal parts, except for the snap hooks of the pull cable and housing assembly, and of the retaining line of the LRU-12/A and LRU-13/A rafts, shall be individually protected against damage by means of the cellulosic cushioning material conforming to PPP-C-843. The rigid and metal parts shall also be covered by the cellulosic cushioning material to prevent the puncture or abrading of the raft, the supply pocket and the accessory equipment container, as applicable, damage to themselves, or to any part of the raft due to concussion when the raft is dropped. Each slide fastener, including the slider, and the grommets on the cylinder sling, shall be completely covered by the pressure-sensitive tape conforming to PPP-T-76. The pull cable and housing assembly of each LRU-12/A and LRU-13/A raft shall be safety wired together as specified in the applicable drawings. All the applicable areas of each raft shall be covered with a minimum amount of zinc stearate or talc to prevent adhering of the adjacent cloth surfaces during normal storage and transportation conditions.

3.10.3 Folding of the raft. The raft inflatable tube and seat shall be completely evacuated of air and all the topping-off valves shall be in the closed position. There shall not be any trapped air in the folds of the raft.

3.10.3.1 LRU-1/P rafts. The LRU-1/P rafts shall be folded in accordance with Drawing 62A82D13.

3.10.3.2 LRU-12/A and LRU-13/A rafts. The accessory container shall be placed on the raft bottom of the deflated raft as in Drawings 62A82D12 and 62A82D13, as applicable. The accessory container shall be tied to the nearest life line patch loop with a bowline knot. The rafts shall be folded as in Drawings 62A82D12 and 62A82D13, as applicable.

3.10.4 Insertion of the raft into the carrying case.

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3.10.4.1 LRU-1/P rafts. The LRU-1/P rafts shall be placed in their respective carrying cases with the axis of the cylinder sling moving in the same direction as the length of the raft. The raft shall be inserted into the carrying case so that the loop of the pull cable is placed toward the end of the case containing the end flap. The rip cord pins shall be inserted through the cones, and the case snapped closed. The rip cord handles shall be placed under the flap as in Drawings 62A82H5 and 62A82H6, as applicable. A warning tag conforming to UU-T-81, type B, not smaller than size 4, and strung with twine; shall be securely tied to the center handle of the carrying case. The tag shall protrude from the carrying case and shall contain the following information:

WARNING

THIS RAFT IS NOT COMPLETE AND SHOULD NOT BE USED UNTIL ALL THE APPLICABLE SURVIVAL EQUIPMENT HAS BEEN ADDED AND THE APPLICABLE CARBON DIOXIDE FILLED CYLINDER AND VALVE ASSEMBLY HAVE BEEN INSTALLED ON THE RAFT.

3.10.4.2 LRU-12/A and LRU-13/A rafts. The LRU-12/A and LRU-13/A rafts shall be placed in their respective carrying cases with the axis of the cylinder sling positioned in the same direction as the length of the carrying case. Close the case by inserting the rip cord pins through the cones and engaging the snaps on the protector flap. Insert the rip cord grip under the flap cover and engage the snaps. After the raft has been packed into the case, a durable red tag, conforming to UU-T-81, type B, not smaller than size 4, and strung with twine; shall be securely attached to the center handles. The tag shall contain the following information on both sides in at least 3/8-inch black letters:

WARNING

THIS LIFE RAFT SHALL NOT BE USED UNTIL SUBJECTED TO THE CALENDAR INSPECTION REQUIREMENTS OF NAVAIR 13-1-6.1.

3.11 Workmanship. After completion of the final assembly, the life rafts shall be thoroughly cleaned and all loose thread, lint and foreign matter shall be removed. The metal components shall not be misaligned nor contain any sharp edge, crack, dent, nick, burr or sliver. The life rafts shall not contain any spot, stain, non-specified hole, abraded area, tear, cut, mend or needle chew. Because of the emergency and life support use of this equipment, the importance of providing a product of uniform excellent quality cannot be overemphasized. The life rafts shall be uniform in quality and shall be free from irregularities or defects which could adversely affect performance, reliability or durability. The life rafts shall conform to the quality and grade of product established by this specification. The occurrence of defects shall not exceed the acceptance criteria established herein.

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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 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection. Qualification inspection consists of examinations and tests performed on samples submitted for approval as qualified products (see 4.3).

b. First article inspection. First article inspection consists of examinations and tests performed on samples which are representative of the production item after award of a contract to determine that the production item conforms to the requirements of this specification (see 4.4).

c. Quality conformance inspection. Quality conformance inspection consists of examinations and tests performed on individual products or lots to determine conformance of the products or lots with the requirements set forth in this specification (see 4.5).

4.3 Qualification inspection. The qualification inspection for the four and seven man inflatable life rafts shall consist of the examinations and tests specified in table I.

4.3.1 Qualification samples. The qualification inspection samples shall consist of one inflatable life raft of any type (see 3.1). The qualification samples shall be forwarded to the test facility set forth in the letter of authorization to submit samples (see 6.3). The samples shall be plainly identified by securely attached durable tags marked with the following information:

Samples for qualification inspection
LIFE RAFT, INFLATABLE (number of men, as applicable)
Manufacturer's designation or number
Submitted by (name) (date) for qualification inspection
in accordance with the requirements of MIL-L-5567F
under authorization (reference authorizing letter
and number) (see 6.3)

4.3.2 Retention. The retention of qualification shall consist of periodic verification to determine compliance of the qualified four and seven man inflatable life rafts with the requirements of this

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specification. Periodic verification shall be by certification unless otherwise specified by the activity responsible for the Qualified Products List and shall be at intervals of not more than two years.

4.4 First article inspection. The first article inspection of the four and seven man inflatable life rafts shall consist of the examinations and tests specified in table II. The examinations and tests shall be performed in the sequence listed.

4.4.1 First article samples. Unless otherwise specified, as soon as practicable after award of the contract or purchase order, the manufacturer shall submit three life rafts. The samples shall be representative of the construction, workmanship, components and materials to be used during production. When a manufacturer is in continuous production of these life rafts from contract to contract, submission of further first article inspection samples on the new contract may be waived at the discretion of the acquiring activity (see 6.2.1c). Approval of the first article inspection samples or the waiving of the first article inspection does not waive the requirements for performing the quality conformance inspection. The first article inspection samples shall be furnished to the Government as directed by the contracting officer (see 6.2.1d).

4.4.2 Disposition of first article samples. Upon completion of the first article inspection, all the applicable inspection reports and, when applicable, recommendations and comments pertinent for use in monitoring production, will be forwarded by the Government activity responsible for the inspection program (see 6.2.1d), to the contracting officer. One of the approved first article inspection sample life rafts will be returned to the manufacturer for use in monitoring production. One life raft will be consumed or destroyed in the first article inspection and shall not be considered as part of the quantity to be delivered under the contract. The other life raft will be retained by the inspection laboratory for reference and will be returned to the manufacturer with the samples from the final lot as required by 4.5.1.3.

4.5 Quality conformance inspection. The sampling and inspection levels shall conform to MIL-STD-105. The quality conformance inspection shall consist of the tests and examinations specified in table III.

4.5.1 Sampling.

4.5.1.1 Inspection lot.

4.5.1.1.1 Adhesive. An inspection lot size shall be expressed in units of one batch of the MIL-A-5540 adhesive. An inspection lot shall consist of all the batches of the MIL-A-5540 adhesive used by the life raft manufacturer during one day's production of the life rafts (see 3.5.3). The sample unit shall be one batch of the adhesive used during one day's production of the life rafts.

4.5.1.1.2 Topping-off valves. An inspection lot size shall be expressed in units of one topping-off valve. An inspection lot shall

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consist of all the topping-off valves received by the life raft manufacturer at one time. The sample unit shall be one topping-off valve.

4.5.1.1.3 Life rafts. An inspection lot size shall be expressed in units of one life raft of one type made essentially under the same conditions and from the same materials and components. The sample unit shall be one life raft of the type representing the lot.

4.5.1.1.4 Packaging. An inspection lot size shall be expressed in units of one fully prepared shipping container, including life rafts, fully prepared for delivery from essentially the same materials and components. The sample unit shall be one shipping container, including life rafts, fully prepared for delivery with the exception that it need not be sealed.

4.5.1.2 Sampling for tests and examinations of the components, the life rafts and packaging. The sample size, acceptance criteria, tests, and examinations required for the components, life rafts and packaging shall be as specified in table III and 4.5.1.3.

4.5.1.3 Sampling for tests and examinations of the life rafts at a laboratory. Upon completion of the tests and examinations specified in 4.5.1.2, a random sample shall be selected from each lot in accordance with MIL-STD-105, inspection level S-3 (see 6.2.1). The sample size shall be based only on the applicable sample size code letter corresponding to the inspection level S-3. Each life raft selected as a sample unit shall be identifiable by its assigned serial number (see 3.8), and shall be forwarded to the Government laboratory specified in the acquisition document (see 6.2.1f), for the following tests and examinations:

TESTS AND EXAMINATIONS

Weight	(4.7.6)
Operation (carbon dioxide)	(4.7.3)
Pressure	(4.7.4)
Leakage	(4.7.5)
Visual examination	(4.7.2.1)
Dimensional check	(4.7.2.2)

The Government activity responsible for conducting the inspection program shall be specified in the contract or order (see 6.2.1f). The tests and examinations shall be conducted in the order listed. The acceptable quality level shall be 1.5 defects per hundred units for each test and examination, except that the acceptable quality level for the minor defects (visual examination) shall not exceed 15.0 defects per hundred units and the dimensional check shall not exceed 100 defects per hundred units. The lot, from which the samples were selected, shall not be shipped until the samples have been approved by the cognizant Government activity. Final acceptance of the lot shall be based upon satisfactory completion of the inspection plan by the cognizant quality assurance representative/specialist at the contractor's facility. A rejected lot shall not be resubmitted except with the approval of the contracting

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officer. The costs of tests and examinations on samples initially submitted from a lot, shall be borne by the Government. The costs of the tests and examinations on samples resubmitted from a reworked lot or from a new lot, which is necessitated by the rejection of a previous lot, shall be borne by the manufacturer. The inspection samples shall be identified by their serial numbers (see 6.2.1e). The serial numbers of the units in the lot, represented by the inspection samples, shall be furnished to the inspection facility. Upon completion of the tests and examinations, the inspection facility shall return the samples to the manufacturer at the manufacturer's expense.

4.6 Inspection conditions.

4.6.1 Atmospheric conditions. Unless otherwise specified, all the inspections required by this specification shall be conducted at an atmospheric pressure of 711.2 to 812.8 mm (28 to 32 inches) of mercury and at a temperature of 25 ± 10 degrees Celsius (77 ± 18 degrees Fahrenheit). If the final values of the ambient temperature or barometric pressure, at the end of the 4 hour waiting period of the leakage inspection, 4.7.5, are different from the initial values recorded at the start of the inspection, the following corrections shall be made to the final pressure readings in psig.

4.6.1.1 Temperature correction. For each degree Celsius rise in temperature, 0.056 psig shall be subtracted from the final pressure reading. For each degree Celsius drop in temperature, 0.056 psig shall be added to the final pressure reading. The corresponding correction per degree Fahrenheit is 0.031 psig.

4.6.1.2 Barometric pressure correction. For each 2.54 mm (0.1 inch) of mercury rise in barometric pressure, 0.049 psig shall be added to the final temperature-corrected pressure reading. For each 2.54 mm (0.1 inch) of mercury drop in barometric pressure, 0.049 psig shall be subtracted from the final temperature-corrected pressure reading.

4.6.2 Pressure management. The pressure shall be measured by means of a mercury manometer calibrated in psig or inches of mercury. To convert inches of mercury to psig, multiply the inches of mercury by 0.49.

4.6.3 Inspection area and equipment. The area in which the rafts are inspected shall be adequately protected to preclude damage to the units. The area and inspection equipment shall be free of sharp or rough edges, burrs, protrusions and anything else which will cut, tear or damage the life raft or the components.

4.6.4 Air. When use of air is specified in an inspection, the air used shall not contain any oil or condensed water.

4.7 Inspection methods.

4.7.1 Flange adhesion to the spool. The adhesion of the topping-off valve flange to the spool shall be determined as follows:

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The rubber flange shall be slit into six equal segments. One upper and one lower segment shall be clamped in the jaws of a suitable tensile testing machine operating with the movable jaw separating at a rate of $12 \pm 1/2$ inches per minute under no load. Failure shall occur in the molded rubber flange and not by merely stripping of the flange from the brass spool. All the segments shall be tested.

4.7.2 Visual examination.

4.7.2.1 Life rafts. Every life raft, complete with the accessories in its carrying case, shall be examined visually for critical defects to determine conformance to this specification. Each life raft, complete with the accessories in its carrying case, selected as a sample unit from the lot, shall be thoroughly checked dimensionally and examined visually for minor defects to determine conformance to this specification. The classification and list of defects, tables IV and V, as applicable, shall be used to classify and enumerate the defects found.

4.7.2.2 Packaging. Each of the fully prepared shipping containers, containing life rafts, selected as a sample unit from the lot, shall be visually examined to determine that the packaging, packing and marking conform to this specification. The list of defects, table VI, shall be used to enumerate the defects found.

4.7.3 Operation (carbon dioxide). The life raft shall be removed from the carrying case (quality conformance testing only) and spread out and placed in a horizontal position on the floor or table of the inspection area. The specified inflation assembly (see Drawings 62A82H1 or 62A82H2, as applicable) shall be installed on the life raft. The raft shall be inflated by pulling the pull cable of the inflation valve, with an abrupt quick motion to actuate the inflation valve. The carbon dioxide shall enter the flotation tubes through the manifold assembly without any evidence of leakage. During the inflation, the life raft shall be observed for impediment or blockage to the flow of the carbon dioxide gas or restriction by any component. The operation inspection shall be conducted at the prevailing ambient temperature and barometric pressure. The life raft shall inflate to its design shape as shown in Drawings 62A82H1 or 62A82H2, as applicable, within thirty seconds, the time being recorded from the instant the inflation valve is actuated. Forty plus or minus 25 minutes after the raft has been inflated, the pressure in the bow and stern compartments shall be measured. The pressure readings shall be taken with the life rafts in a horizontal position. Immediately after the pressure reading is taken, the temperature and barometric readings of the inspection area, in the vicinity of the life raft, shall be recorded. The bow and stern compartment pressure readings shall then be corrected to 21.1 degrees Celsius (70 degrees Fahrenheit) and a barometric pressure of 760 mm (29.92 inches) of mercury using the correction factors specified in 4.6.1.1 and 4.6.1.2. The corrected pressure in the bow and stern compartments and the difference in the pressure between the bow and stern compartments shall conform to 3.9.3. While under pressure, the compartments, floor and topping-off

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valves shall be inspected for conformance to the requirements specified in 3.9.3. Upon completion of the testing and examination, the bow and stern compartments shall be completely deflated and the raft shall then be subjected, if applicable, to the pressure inspection, 4.7.4.

4.7.4 Pressure. The life raft shall be placed in a horizontal position on the floor of the inspection area. All the pressure readings shall be taken with the raft in this position. The bow compartment of the inflatable tube shall be inflated with the air specified in 4.6.4 to a pressure of 5.0 psig and the stern compartment and inflatable seat shall be completely deflated with the topping-off valves in the open position. The air supply shall be securely shut off and after a minimum of 10 minutes, the pressure shall be checked and readjusted, if necessary, to the original pressure of 5.0 psig. At the end of a minimum of 10 minutes after the readjustment period, the pressure in the bow compartment shall be as specified in 3.9.4.1. The bow compartment shall be examined while under pressure for conformance to the requirements specified in 3.9.4.1. Upon completion of the testing and examination, the bow compartment shall be completely deflated and the topping-off valve left in the open position. The same test and examination shall then be conducted on the stern compartment of the inflatable tube and on the inflatable seat simultaneously, except that the inflatable seat shall be inflated to a pressure of 2.0 psig. The pressure in the inflatable seat, at the end of the test period, shall be as specified in 3.9.4.2. Upon completion of the testing and examination, the stern compartment of the inflatable tube and the inflatable seat shall be completely deflated and the raft shall then be subjected to the leakage inspection, 4.7.5 (see 3.9.4).

4.7.5 Leakage. The raft shall be placed in a horizontal position on the floor of the test area. All the temperature and pressure readings shall be taken with the raft in this position. The inflatable tube and seat shall be inflated through their respective topping-off valves. The bow compartment of the inflatable tube shall be inflated with air (see 4.6.4) to a pressure of 2.0 psig and the stern compartment and the inflatable seat shall be completely deflated with the topping-off valves in the open position. The air supply shall be securely shut off and after a minimum of 15 minutes, the pressure shall be checked and readjusted, if necessary, to the original pressure of 2.0 psig. The temperature and barometric pressure shall be recorded at this time. At the end of a minimum of 4 hours after the readjustment period, the pressure shall be measured and corrected for any change in the temperature or barometric pressure (see 4.6). The corrected pressure shall be as specified in 3.9.5.1. The bow compartment shall then be completely deflated and the topping-off valve left in the open position. The same inspection shall then be conducted on the stern compartment of the inflatable tube and on the inflatable seat simultaneously, except that the inflatable seat shall be inflated to a pressure of 1.0 psig. The corrected pressure in the inflatable seat at the end of the test period shall be as specified in 3.9.5.2. The life rafts may be stacked one upon another during the waiting period of the leakage inspection, provided the following shall be adhered to:

a. The temperature shall be recorded at a level comparable to the height at which the raft being inspected was stowed during the 4 hour inspection waiting period.

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b. At the end of a minimum of 4 hours from the readjustment period, the raft to be checked for pressure shall be removed from the stacking and placed in a horizontal position on the floor of the inspection area. The barometric pressure of the inspection area shall be recorded. The pressure in the raft shall be measured and corrected for any change in the temperature or barometric pressure (see 4.6). In no event shall the pressure in the raft be determined with another raft stacked upon it.

4.7.6 Weight of the raft. The weight of the raft shall be determined on a scale capable of weighing to the nearest 0.50 pound.

4.7.6.1 Cylinder weight. Each time a cylinder is expended for inspection purposes and refilled, the cylinder shall be weighed and remarked. The weight of the cylinder and the markings shall be as specified in 3.8, 3.8.1 and 3.8.1.1.

4.7.7 Extreme temperatures.

4.7.7.1 At -18 degrees Celsius. The deflated life raft, with the inflation assembly specified in 4.7.3 attached, shall be exposed at -18 ± 1 degrees Celsius (0 ± 2 degrees Fahrenheit) for a minimum of 48 hours. The life raft shall then be removed to a room having a temperature of 24 ± 2 degrees Celsius (75 ± 5 degrees Fahrenheit) and the inflation valve shall be actuated immediately. The inflation system shall function properly and the carbon dioxide shall enter the raft flotation tube, through the inflation and inlet valves, without any evidence of leakage. The life raft shall inflate to its design shape as shown in Drawings 62A82H1 or 62A82H2, as applicable, within 15 minutes, the time being recorded from the instant the inflation valve is actuated. During the inflation, the raft shall be observed for impediment or blockage to the flow of the carbon dioxide gas or restriction by any component. While inflated, the raft shall be examined for material and construction failure, separating of the seams, seam tapes, patches, attachments, twisting or distortion of the floor or flotation tube. After $1 \frac{1}{4}$ hour, the raft flotation tubes shall be completely deflated and the raft shall then be subjected to the leakage inspection, 4.7.5. Upon completion of the leakage inspection, the raft flotation tubes shall be completely deflated and the raft then subjected to the 71.1 degrees Celsius (160 degrees Fahrenheit) inspection, 4.7.7.2.

4.7.7.2 At 71.1 degrees Celsius. The foregoing in 4.7.7.1 shall be repeated, except that the raft, with the carbon dioxide filled cylinder and valve attached, shall be exposed at 71 ± 1 degrees Celsius (160 ± 2 degrees Fahrenheit), instead of -18 degrees Celsius (zero degrees Fahrenheit), for a minimum of 48 hours, and shall have been rounded into design shape within thirty seconds after the inflation valve is actuated.

4.7.8 Strength of attachments. The attachment of the topping-off valve, manifold, life line and sea anchor patches, and boarding, righting, and carrying case handles shall be inspected for

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strength of attachment in a suitable jig. The direction of the pull shall be perpendicular to the patch. The speed of the movable jaw of the testing apparatus under no load shall be $12 \pm 1/2$ inches per minute.

4.7.9 Strength of seam.

4.7.9.1 Seam breaking strength. Two inch wide untaped seam specimens shall be cut perpendicular to the seam. The strength of the seam shall be determined in accordance with FED-STD-191, method 5102.

4.7.9.2 Seam separation. Two inch wide untaped seam specimens cut perpendicular to the seam shall be subjected to a 90-pound load for $24 \pm 1/2$ hours at a temperature of 60 ± 1 degrees Celsius (140 ± 2 degrees Fahrenheit). The seam shall not separate.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or C in accordance with MIL-STD-794 or industrial, as specified (see 6.2.lg).

5.1.1 Level A. The life rafts complete with their required accessories protected, folded, and inserted into their carrying cases, as specified in 3.10 through 3.10.4.2, as applicable, shall be packaged in accordance with MIL-P-116, method III. The life rafts shall be packaged within a snug fitting fiberboard container conforming to PPP-B-636, style CSSC, type CF or SF, weather resistant class, variety SW, grade V3c or V3s. All seams, joints, flaps, etc., including the manufacturer's joint shall be secured with adhesive. Each container shall be reinforced with pressure-sensitive filament tape conforming to PPP-T-97 or with plastic banding. Steel banding is prohibited.

5.1.2 Level C or industrial. Each life raft, prepared for packaging as specified in 3.10, shall be individually packaged to afford the minimum degree of protection necessary to prevent deterioration or damage during shipment under normal environmental conditions and commercial modes of transportation.

5.2 Packing. Packing shall be level A, B or C in accordance with MIL-STD-794 or industrial, as specified (see 6.2.lg). Shipping containers, insofar as possible, shall be uniform in size and shape and of minimum cube and tare weight. Each shipping container shall contain rafts of only one type.

5.2.1 Level A and B. The life rafts, packaged as specified in 5.1.1, shall be packed on their sides within a snug fitting fiberboard container conforming to PPP-B-636, type CF or SF, weather resistant class, variety SW, grade V3c or V3s. Each container shall be constructed, closed and reinforced with nonmetallic banding or PPP-T-97 reinforced filament tape in accordance with the appendix to PPP-B-636.

5.2.2 Level C or industrial. The packaged life rafts, which require packing for acceptance by the carrier, shall be packed

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within exterior type shipping containers in a manner that will insure safe transportation at the lowest rate to the point of delivery. The shipment shall conform to the minimum requirements of the rules and regulations applicable to the mode of transportation selected (see 2.2).

5.3 Marking. The interior and exterior containers shall be marked in accordance with MIL-STD-129 and shall include the date of manufacture (month and year) and the contract or order number. The exterior containers shall also be marked to conform with the Uniform Freight Classification and National Motor Freight Classification Rules, as applicable. In addition, regardless of the mode of transportation, the fiberboard container containing the carbon dioxide filled cylinder, the exterior shipping container shall contain a green label in accordance with the Code of Federal Regulations for the Transportation of Explosives and Other Dangerous Articles. In addition, the above shall be marked "NON-FLAMMABLE COMPRESSED GAS" and "CARBON DIOXIDE LIQUIFIED." The size and color of the markings shall conform to the Code of Federal Regulations for the Transportation of Explosives and Other Dangerous Articles, Title 49, Section 100-199. The markings shall be conspicuous and legible.

6. NOTES

6.1 Intended use. These life rafts are intended for use as emergency and life support equipment for aircraft personnel forced down at sea.

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, Government part number and quantity desired.
- c. Whether first article inspection is waived (see 4.4.1).
- d. Name and address of the first article inspection laboratory and the Government activity responsible for conducting the inspection program (see 4.4.2).
- e. Issuance of a block of serial numbers to cover the individual serialization of the rafts for the quantity to be purchased (to be assigned by the acquiring activity) (see 3.8 and footnote 1/ of table III).
- f. Name and address of the quality conformance inspection facility including the laboratory and Government activity responsible for conducting the inspection program (see 4.5.1.3).

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- g. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).
- h. Whether any special markings are required (see 5.3).
- i. Certificate of compliance for:
- (1) Material and components conforming to applicable specifications, standards and drawings (see 3.3 and 6.2.2).
 - (2) The age of the materials and components (see 3.3 and 6.2.2).
- j. Whether survival items will be supplied as Government furnished equipment (GFE) for initial outfitting of aircraft (see 3.5.8).
- k. Whether survival items will be acquired with the life raft assemblies for initial outfitting of aircraft (see 3.5.8).
- l. Selection of samples to be performed by the cognizant quality assurance representative/specialist (see 4.5.1.3).
- m. Whether the carbon dioxide inflation assembly will be supplied with the LRU-1/P life raft (see 3.4 and 3.5.6.2.2).

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</u>	<u>Applicable DID no.</u>
3.3	Certificate of compliance for the age of materials and components	DI-E-2121
4.4.2	First article inspection reports	DI-T-5329

(Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Form Center or as directed by the contracting officer.)

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6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualified for inclusion in Qualified Products List (QPL-5567) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Commander, Naval Air Systems Command, Department of the Navy, Washington, DC 20360; however, authorization for qualification of products shall be obtained from the Commanding Officer, Naval Air Development Center, Warminster, PA 18974, Attention: Code 6031. Prior to submission of the samples for qualification inspection, the manufacturer shall submit a request to the Naval Air Development Center (Code 6031) indicating a date on which the samples can be forwarded and requesting an authorization number to accompany the samples plus the name and address of the qualification inspection facility.

6.3.1 Qualification inspection report. When requested, the manufacturer shall submit an inspection report in accordance with SD-6, Provisions Governing Qualification.

6.4 First article. When first article inspection is required, the life rafts will be tested and should be a first production item. The first article should consist of three units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, test and approval of the first article.

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

Custodians:
Navy - AS
Army - ME
Air Force - 99

Preparing activity:
Navy - AS
(Project No. 4220-0272)

Review Interest:
Air Force-84

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TABLE I. Qualification examinations and tests (see 4.3).

Inspection	Paragraph	
	Requirement	Method
Weight of the raft	3.9.6	4.7.6
Cylinder weight	3.8.1	4.7.6.1
Operation (carbon dioxide)	3.9.3	4.7.3
Pressure	3.9.4 through 3.9.4.2	4.7.4
Leakage	3.9.5 through 3.9.5.2	4.7.5
Visual examination	3.4, 3.7, 3.11 and applicable drawings	4.7.2.1
Dimensional check	3.6 and applicable drawings	4.7.2.1
Packaging	-	4.7.2.2
Strength of attachments	3.9.1.2	4.7.8
Seam breaking strength	3.9.2.1	4.7.9.1
Seam separation	3.9.2.2	4.7.9.2

TABLE II. First article examinations and tests (see 4.4).

Inspection	Paragraph	
	Requirement	Method
Weight of the raft	3.9.6	4.7.6
Operation (carbon dioxide)	3.9.3	4.7.3
Pressure	3.9.4 through 3.9.4.2	4.7.4
Leakage	3.9.5 through 3.9.5.2	4.7.5
Visual examination	3.4, 3.7, 3.11 and applicable drawings	4.7.2.1
Dimensional check	3.6 and applicable drawings	4.7.2.1
Packaging	-	4.7.2.2
Strength of attachments	3.9.1.2	4.7.8
Seam breaking strength	3.9.2.1	4.7.9.1
Seam separation	3.9.2.2	4.7.9.2

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TABLE III. Sample size, acceptance criteria, tests, and examination of the components, the life rafts, and preparation for delivery (see 4.5.1.2).

Inspection	Paragraph		Sample size	Acceptance criteria
	Requirement	Method		
Visual examination	-	4.7.2.1	Every life raft for critical defects. Inspection level II for minor defects.	Reject all units with any critical defects and an acceptable quality level of 15.0 defects per hundred units for minor defects.
Dimensional check	-	4.7.2.1	Inspection level S-3	Total acceptable quality level of 100 defects per hundred units.
Operation (carbon dioxide) <u>1/</u>	3.9.3	4.7.3	Every life raft <u>3/</u>	Reject all defective units.
Pressure <u>1/</u> , <u>2/</u>	3.9.4 through 3.9.4.2	4.7.4	Every life raft	Reject all defective units.
Leakage <u>1/</u>	3.9.5 through 3.9.5.2	4.7.5	Every life raft	Reject all defective units.
Weight	3.9.6	4.7.6	Inspection level III <u>4/</u>	Acceptance number zero, rejection number one
Cylinder weight	3.8.4	4.7.6.1	Every life raft	Reject all defective units
Packaging	-	4.7.2.2	Inspection level S-2	Total acceptable quality level of 4.0 percent defective

1/ These inspections shall be performed in sequence when tested as a completely assembled life raft. The operation (carbon dioxide) inspection shall be performed first, the pressure inspection second and the leakage inspection last. If the pressure test is performed prior to final assembly (see footnote 2/), this test shall be removed from the sequence. The results of the inspections shall be identifiable by the assigned serial number (see 6.2.1e), which shall be marked on the life raft as specified in 3.8.

2/ Pressure inspection may be performed at any time prior to, or after final assembly of the life raft. If performed after final assembly, the sequence outlined in footnote 1/ shall be adhered to.

3/ One life raft out of ten or fraction thereof shall be inspected with the life raft in its carrying case (unless the carrying case is not a required component), complete with the required accessories and survival equipment specified.

4/ The sample size shall be based only on the applicable sample size code letter corresponding to the specified inspection level of MIL-STD-105.

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TABLE IV. Classification of defects for visual examination of the life rafts (see 4.7.2.1).

Critical	Minor
1. Any hole, scissors or knife cut, tear, mend, patch or burn. <u>1/</u>	201. Gage of stitching irregular.
2. Any cloth damaged, bruised, contains imperfections or is otherwise defective. <u>1/</u>	202. One or more spots or stains. <u>2/</u>
3. Raft bottom missing, not reinforced or attached as specified.	203. Overlap for cemented seams or seam tapes in excess of requirements.
4. Overlap for the cemented seams less than 5/8 inch.	204. Cement on cloth surface around patches, attachments, and seam tapes not visible or in excess of one inch.
5. Any stitching in the inflatable tube, raft bottom or inflatable seat.	205. Any end of the life line not secured as specified.
6. An inflatable tube or seat seam not taped as required.	206. Base of any life life patch loop bartacked 9/16 to 3/4 inch.
7. Any seam separating in a pressure retaining section or point of attachment of the floor to the inflatable tube.	207. One life line patch missing.
8. Carbon dioxide inflation assembly damaged <u>3/</u> ; not properly installed, any part missing, not specified type or otherwise defective.	208. Any identification or instruction marking missing, incorrect, illegible, incomplete or improperly located.
9. Manifold or manifold hose damaged, improperly located, bent, folded, crimped or otherwise defective.	209. Thong omitted or not securely attached in the slide fastener pull, where applicable.
10. Any topping-off valve damaged <u>3/</u> ; missing or installed in any inflatable tube in an open position.	210. Pull cable and housing assembly not safety wired together or material of the safety wire not as specified. <u>4/</u>
11. Handpump missing, inoperative or does not fit the topping-off valve. <u>4/</u>	211. Any metal component surface rough, misaligned or contains any nick, burr, or other flaws.
	212. Any snap fastener missing, mismatched or improperly clinched resulting in cutting of the cloth, or otherwise defective. <u>5/</u>

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TABLE IV. Classification of defects for visual examination of the life rafts (see 4.7.2.1) (continued).

Critical	Minor
12. Life line missing or does not encircle the entire periphery of the raft.	213. Any grommet, missing or improperly clinched resulting in cutting of the cloth.
13. Sea anchor assembly missing.	214. Raft not properly folded or not placed in the carrying case as specified.
14. Carrying case assembly missing.	215. Retaining strap missing; any part of the assembly missing, damaged, not properly installed, or otherwise defective. <u>4/</u>
15. The accessory container or supply pocket not securely attached as specified. <u>4/</u>	216. Any pocket or accessory container not snapped closed; any emergency container or combination supply pocket and bailer not fully zippered, where applicable.
16. Any specified component missing. <u>3/</u>	217. Any cut edge of the uncoated nylon fibrous material not seared or contains sharp edges.
17. Any abrasion patch or topping-off valve outer patch missing.	218. Faulty stitching. <u>6/</u>
18. Two or more adjoining life line cover patches missing.	219. Any row of stitching omitted.
19. Sea anchor mooring patch assembly missing.	220. Number of stitches plus or minus two or more per inch outside the specified limits. <u>7/</u>
20. Any boarding or righting handles damaged <u>3/</u> ; missing or otherwise defective.	221. Loose stitching tension resulting in a loose seam.
21. Righting line damaged <u>3/</u> ; missing or not properly attached or installed.	222. Tight stitching tension resulting in the breaking of the stitches when normal pull is applied. <u>8/</u>
22. Any cementing operation not in accordance with requirements. <u>3/</u>	223. Any needle chew. <u>2/</u>
	224. Any life line damaged, not properly installed or not one continuous length.

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TABLE IV. Classification of defects for visual examination of the life rafts (see 4.7.2.1) (continued).

Critical	Minor
	<p>225. Any life line patch not properly constructed, installed or located.</p> <p>226. Two or more line cover patches missing.</p> <p>227. Any slide fastener missing, not specified type, size, style; any part of the assembly omitted, bent, broken, movement of the slider interfered with or otherwise defective. <u>9/</u></p> <p>228. Any line or cord missing, damaged or otherwise defective.</p> <p>229. Life raft not orange in color or the underside of the raft bottom not gray or black in color.</p> <p>230. Sea anchor damaged or otherwise defective.</p> <p>231. Any carrying case assembly component missing or damaged.</p> <p>232. Any specified component defective. <u>2/</u></p> <p>233. Sea anchor cover patch missing or not properly attached to the raft.</p> <p>234. Any patch, seam tape or attachment separating.</p> <p>235. Metal components of the life raft assembly not covered with cellulosic cushioning material or pressure sensitive tape as required.</p>

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TABLE IV. Classification of defects for visual examination of the life rafts (see 4.7.2.1) (continued).

Critical	Minor
	<p>236. Seam tape installations not within specified requirements.</p> <p>237. Any inflatable seat topping-off valve damaged. <u>2/</u></p> <p>238. Raft not connected to the carrying case rip cord or rip cord pins not inserted through the cones. <u>4/</u></p>

- 1/ The defect shall be classified as critical if it is in the inflatable tube, raft bottom or inflatable seat, otherwise it shall be classified as a minor defect.
- 2/ The defect shall be classified as a minor defect when it does not affect function; otherwise, it shall be classified as a critical defect.
- 3/ The defect shall be classified as critical when it affects function; otherwise, it shall be classified as a minor defect.
- 4/ These defects are only applicable to the LRU-12/A and LRU-13/A rafts.
- 5/ The snap fasteners shall be checked for proper functioning and attachment by snapping closed and unsnapping each of the snap fasteners at least three times.
- 6/ Not specified stitch type, backstitching missing, skipped or broken stitches or run-offs.
- 7/ Stitches per inch defects are to be scored only when the condition exists on the major portion of the seam.
- 8/ Puckering is evidence of tight tension. When puckering is evident, the seam shall be tested by exerting normal pull in the lengthwise direction of the seam or stitching.
- 9/ The slide fasteners shall be checked for proper function by opening and closing each slide fastener at least three times along its entire length.

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TABLE V. List of defects for finished dimensions (see 4.7.2.1).

Examine	Defect
Measure the life raft, carrying case, accessories and all the visible components.	Any measurement deviating from the dimensions and tolerances as specified in 3.6 and applicable drawings shall be enumerated as a dimensional defect.

TABLE VI. List of defects for packaging (see 4.7.2.2).

Item	Defects
Exterior and interior markings	Missing, incorrect, incomplete, illegible, of improper size, location, sequence or method of application; markings not the same on the interior and exterior containers.
Packaging and packing materials	Any non-conforming component; any component missing, damaged or otherwise defective.
Workmanship	Inadequate application of the components such as incomplete closure of the unit package, container flaps, loose strappings, etc.; bulging or distortion of the containers.
Exterior and interior weight or content	Number per container is more or less than required; gross or net weight exceeds the requirements; more than one type in the same container.

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TABLE VII. List of survival items for life rafts LRU-12/A, LRU-13/A and LRU-1/P (see 3.5.8).

Item of survival equipment	Applicable document	Type, class or size	Application	Quantity of item required
<u>FURNISHED WITH RAFT:</u>				
Nylon cord (Air Force only)	MIL-C-5040	Type III	LRU-1/P	25 feet
Accessory container	Drawing 62A82D7	-	LRU-12/A LRU-13/A	1 1
Retaining line	Drawing 62A82H3	-	LRU-12/A LRU-13/A	1 1
Righting line	MIL-R-17343	Type I	LRU-12/A LRU-13/A	10 feet 10 feet
<u>PACKED IN RAFT POCKET:</u>				
Light, marker, distress aircrew, SDU-30	MIL-L-23614	-	LRU-12/A LRU-13/A	1 1
Battery, dry	MIL-B-18/224	BA-1328/U	LRU-12/A LRU-13/A	2 2
Light, marker, distress, SDU-5/E	MIL-L-38217	Type I, class 3	LRU-12/A LRU-13/A	1 1
<u>PACKED IN ACCESSORY CONTAINER:</u>				
Dye marker	MIL-S-17980	-	LRU-12/A LRU-13/A	3 4

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TABLE VII. List of survival items for life rafts LRU-12/A, LRU-13/A and LRU-1/P (see 3.5.8) (continued).

Item of survival equipment	Applicable document	Type, class or size	Application	Quantity of item required
<u>PACKED IN ACCESSORY CONTAINER</u>				
<u>(Continued):</u>				
Water storage bag	MIL-B-8571	-	LRU-12/A LRU-13/A	2 3
Canned water	MIL-W-15117	10 oz	LRU-12/A LRU-13/A	4 7
Opener, can, hand (disposable, combination opener and punch)	FF-O-605	-	LRU-12/A LRU-13/A	1 1
Sunburn ointment	MIL-S-11262	-	LRU-12/A LRU-13/A	1 1
Rations	MIL-F-15381	-	LRU-12/A LRU-13/A	4 7
Bailing sponge	L-S-00626	-	LRU-12/A LRU-13/A	1 1
Hand pump	MIL-P-8258	Type IV	LRU-12/A LRU-13/A	1 1
Space blanket	MIL-B-36964	Type I	LRU-12/A LRU-13/A	1 1
Signal mirror	MIL-M-18371	Type I	LRU-12/A LRU-13/A	1 1

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TABLE VII. List of survival items for life rafts LRU-12/A, LRU-13/A and LRU-1/P (see 3.5.8) (continued).

Item of survival equipment	Applicable document	Type, class or size	Application	Quantity of item required
<u>PACKED IN ACCESSORY CONTAINER</u> <u>((Continued)):</u>				
Code card	NAVAIR 00-25-513	-	LRU-12/A LRU-13/A	1 1
Whistle	MIL-W-1053	-	LRU-12/A LRU-13/A	1 1
Compass, wrist	Waltham Clock Corp. part number WWC-100 or equal	-	LRU-12/A LRU-13/A	1 1
Pocket knife	MIL-K-818	-	LRU-12/A LRU-13/A	1 1
Nylon cord	MIL-C-5040	Type I	LRU-12/A LRU-13/A	50 feet 50 feet

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