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DEPARTMENT OF DEFENSE HANDBOOK

INSPECTION AND ACCEPTANCE STANDARDS FOR PROPULSION FLUID CELLS AND FITTINGS

This handbook is for guidance only. Do not cite this document as a requirement.

AMSC N/A FSC 4730

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FOREWORD

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

2. This handbook is for guidance only. This handbook cannot be cited as a requirement. If it is, the contractor does not have to comply.

3. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to Commander, Naval Air Warfare Center, Aircraft Division, Code 414100B120-3, Highway 547, Lakehurst, NJ 08733, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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1. SCOPE

1.1 Scope. This handbook applies to all fluid cells manufactured in accordance with MIL-T-5578, MIL-T-6396 (except Type I), and MIL-T-27422. This handbook is for guidance only. This handbook cannot be cited as a requirement. If it is, the contractor does not have to comply.

1.2 Purpose. The purpose of this handbook is to establish:

a. A classification of commonly occurring defects in fluid cells and cell fittings.

b. Standards for normal finish operations.

c. Standards for acceptance limits of rework on new cells in the manufacturer's plant.

d. Limits of acceptable conditions requiring no rework.

e. Inspection criteria for acceptance determination of cells that have been subjected to quality control stand or dissection tests in accordance with MIL-T-5578, MIL-T-6396 (except Type I), and MIL-T-27422.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed below are not necessarily all of the documents referenced herein, but are the ones that are needed in order to fully understand the information provided by this handbook.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the latest issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto.

DEFENSE SPECIFICATIONS

MIL-T-5578	-	Tanks, Fuel, Aircraft, Self Sealing
MIL-T-6396	-	Tanks, Aircraft Propulsion Fluid System, Internal, Removable, Non-self-sealing
MIL-T-27422	-	Tank, Fuel, Crash-Resistant, Aircraft

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the latest issue of the DoDISS, and supplement thereto.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM-D751 - Standard Test Method for Coated Fabrics (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959)

2.4 Order of precedence. In the event of a conflict between the text of this document and the reference cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Approved rework procedures. Approved rework procedures are those rework procedures that have been approved by the local government inspector.

3.2 Back rind. Back rind is a surface blemish defect caused by mold flash material becoming folded inside a fitting cavity.

3.3 Baffle shoes. Baffle shoes are fabric straps usually having holes protected by grommets. These straps are attached to the liner of the cell for the purpose of securing the internal baffles.

3.4 Bleeder cords. Bleeder cords are cords which are built in between the plies for the purpose of evacuating solvents and trapped air from between plies of a cell.

3.5 Bleeder patch. A bleeder patch is a patch on the outside of a cell which covers the cut ends of bleeder cords.

3.6 Blister. A blister is an area of no adhesion between plies of the cell wall.

3.7 Crash resistant tanks. The column heading, crash resistant tanks, which appears in tables I, II, and III applies to both self-sealing and non-self-sealing crash resistant tanks.

3.8 Critical defect. A critical defect is one that judgment and experience indicate could result in hazardous or unsafe conditions for individuals using or maintaining the product; or for major end-item units of which the product is a component, such as ships, aircraft, or tanks; a defect that could prevent performance of their tactical function.

3.9 Delamination. A delamination is an area of no adhesion between plies of the cell wall of such magnitude as to prevent the cell from satisfactorily performing its primary function, that is, to hold propulsion fluid. A delamination is not an area in which adhesion between plies is intermittent, such as where the fabric innerliner adheres primarily to the high points produced by the coarse weave of a reinforcing layer of fabric and does not adhere to the low points (valleys). These areas are essentially unpressurized and do not prevent the cell from satisfactorily holding propulsion fluid.

3.10 Design failure. Failure caused by a physical breakdown of the cell or attach points as a result of imposed loads which the cell was not designed to withstand.

3.11 Deterioration of construction or construction failure. A failure caused by action of the test fluid on any ply or coat of cement or barrier in the cell.

3.12 Dissection test. A destructive test in which the cell is sectioned to permit critical examination of the interstitial areas of the cell (see MIL-T-5578, MIL-T-6396 (except Type I), and MIL-T-27422).

3.13 Fitting leakage. Leakage at the sealing surface of a fitting.

3.14 Fried, scarred, or blown condition. An area in the liner material which has become spongelike, where solvent laden adhesive has "blown" during the vulcanization procedure. This is an area with poor contact to the building form during cure.

3.15 Hanger straps. Straps applied to the outside surface of cells for the purpose of handling cells or securing cells in the cavities.

3.16 Inspector. The quality control inspector or engineer who is directly responsible for the acquiring activity quality control function.

3.17 Integral baffle. An integral baffle is a rubber coated fabric component which is vulcanized into the tank wall construction as a part of the building process.

3.18 Looseness. Area of nonadhesion.

3.19 Lumps and craters. Depressions or craters caused by scuffing of uncured gum stocks or inclusion of cement lumps or foreign material.

3.20 Major defect. A major defect is a defect, other than critical, that could result in failure, or materially reduce the usability of the unit or product for its intended purpose.

3.21 Manufacturing defect. A defect caused by the cell not being fabricated in accordance with applicable drawings and specifications.

3.22 Manufacturing damage. Damage incurred while the cell is in the process of manufacture.

3.23 Minor defect. A minor defect is one that does not materially reduce the usability of the unit or product for its intended purpose or is a departure from established standards having no significant bearing on the effective use or operation of the unit.

3.24 Multiple construction cell. A cell which consists of more than one basic construction.

3.25 Stand test. A static test in which the test cell is filled with fuel or test fluid for a given period of time and then examined for evidence of leakage or material deterioration (see MIL-T-5578, MIL-T-6396 (except Type I), and MIL-T-27422).

3.26 Step off.

a. The edge of a lap of one or more plies of material.

b. The edge of discontinued plies in a multiple construction cell.

3.27 Rework damage. Damage incurred during rework or finishing operation.

3.28 Total effective bond. Amount of bond in fitting flange or lap splice whether or not bond is continuous.

4. GENERAL REQUIREMENTS

4.1 Inspection requirements. The inspection requirements described herein are not intended to supersede or delete any existing quality control standards. It is expected that the manufacturer or acquiring activity will conduct further tests and have other detailed requirements in excess of those specified herein.

4.2 Results. Reporting of results of tests and inspections described in this handbook are in accordance with the applicable contract requirements.

5. DETAILED REQUIREMENTS

5.1 Classification of defects. Defects are classified and limited to fall within one or more of the following classes.

a. Critical defect (see 3.8)

b. Major defect (see 3.20)

c. Minor defect (see 3.23)

5.1.1 Unlisted defects. Unlisted defects, when deemed by the inspector to be such as to adversely affect the serviceability or strength of the cell or fitting, are classified in accordance with the above criteria.

5.2 Use of tables. (See table V for summary)

5.2.1 Table I. Corrections of discrepancies listed in table I are considered to be normal finishing operations and are not counted as defects when properly reworked prior to the time the cell (or fitting) is submitted for acceptance or if the rework is accomplished prior to initiation of stand or dissection tests. An "X" in one or more of the seven columns in the right hand side of the chart indicates the type of cell(s) or fitting(s), or the portion of the cell (interior, exterior) to which a particular inspection is considered applicable.

5.2.2 Table II. This table presents acceptance standards for various defects that may occur on fuel cells that are submitted by the fluid cell manufacturer for acceptance by the acquiring activity. This table is also used for inspection of stand or dissection tested cells (see 5.2.3 and 5.2.4). The left hand columns indicate the applicability of each defect in regard to type of cell, fitting, or location of defect (interior, exterior).

5.2.3 Table III. This table lists inspections and defects that are unique to stand tested cells. For stand tested cells the inspections listed in table III are conducted in addition to the inspections of table II. Stand tests are normally conducted in fixtures lined with brown paper. The "stains" referred in this table are the stains showing on the brown paper when cells are defective. If an alternate method of leak detection is used for stand tests, equivalent criteria are used for defect classification. Leaks that cannot be attributed to physical damage or shown to be a unique case are classified as a critical defect.

5.2.4 Table IV. Table IV lists defects that are applicable to dissection tested cells. These inspections are conducted on dissection tested cells in addition to the inspections of table II. Item 6 of table IV is applicable to replacement fittings that are subjected to dissection tests on a sampling basis as well as to dissection tested cells.

5.2.5 Table V. Table V summarizes the contents of 5.2 and 5.3.

5.3 Action to be taken on identified defects. (See table V for a summary of these actions.)

5.3.1 Minor defects. Discrepancies classified as minor defects are considered acceptable without rework provided they do not exceed the following limits:

a. Cell interior - One per 10 sq. ft. of total cell area. Where an accumulation of minor defects does not exceed the limits specified in the table, they will be considered one defect. For example, an accumulation of five 0.25 inch blisters in any one 5 ft. length of splice (table II, defect 1.a) is counted as one minor defect.

b. Cell exterior - Not to exceed limits specified in table.

c. Installed fittings - Minor defects in installed fittings are counted and included when determining acceptability of cells without rework in accordance with 5.3.1.a. and 5.3.1.b.

d. Replacement fittings - Replacement fittings are considered acceptable without rework if minor defects do not exceed that specified herein. For noncircular fittings, consider bolt circle to be largest dimension of fitting. Minor defects in excess of the criteria listed herein are considered a major defect and reworked prior to acceptance.

(1) Fittings with bolt circle of 6 inches or less - two minor defects permitted.

(2) Fittings with bolt circles larger than 6 inches - three minor defects permitted.

5.3.2 Major defects. Major defects in cells or replacement fittings are corrected using an approved rework procedure prior to acceptance. Major defects detected in cells during stand or dissection tests or in separate fittings subjected to destructive sampling tests are analyzed to determine cause. If the defect can be shown to be a unique case, the lot represented by the defective item may be accepted. If not unique, all like defects must be reworked using the approved rework procedure prior to acceptance of the lot. Appropriate alterations must be made in the manufacturing process to prevent repetition of the defect.

5.3.3 Critical defects. Critical defects in cells or replacement fittings are cause for rejection of the cell. The cell may be deliverable if the manufacturer can devise a special rework technique along with a test procedure, both of which are acceptable to the acquiring activity. When a critical defect is identified in cells subjected to stand or dissection tests, the acquiring activity is notified immediately. If a critical defect is identified during the production sampling test, production is stopped until the problem is resolved and a course of action established that is mutually satisfactory to the cell vendor and the acquiring activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This handbook classifies common defects in fluid cells and cell fittings, establishes requirements for normal finish operations and sets acceptance limits or rework on new cells.

6.2 Supersession note. This handbook replaces MIL-STD-801A (same title). When referenced in a specification or government acquisition document MIL-STD-801A governed the inspection of production fluid cells in the manufacturer's and prime contractor's plants or at government facilities to the extent specified in the contract under which the cells were acquired. The following documents were superseded by MIL-STD-801: ANA Bulletin 107, "Inspection Standards for Stand and Dissection Tested Self-sealing Fuel and Oil Cells;" ANA Bulletin 112, "Acceptance Standards for Self-sealing Fuel and Oil Cells;" ANA Bulletin 434; "Acceptance Standards for Non-self-sealing Type Cells;" and ANA Bulletin 435, "Inspection Standards for Stand and Dissection Tested Non-self-sealing Type Cells."

6.3 Subject term (key word) listing.

Aircraft
Classification
Crash-resistant
Critical
Defects
Finish operations
Fuel
Leakage
Rework
Self-sealing
Stand test

TABLE I. Fluid cell finishing operations. 1/

No	Defects	Bladder Tanks	Self Sealing Tanks	Tank Exterior	Tank Interior	Replacement Fittings	Installed Fittings	Crash Resistant Tanks
1	LOOSE CORNER PATCH	X	X	X	X	X	-	X
2	BLISTERED CHAFING STRIPS	X	X	X	X	-	-	X
3	LOOSE BAFFLE SHOES/INTEGRAL BAFFLE	X	X	-	X	-	-	X
4	LOOSE LINER AT THROAT OF FITTING THAT CAN BE REWORKED BY TRIMMING, RETAINING MINIMUM BOND PERMITTED BY APPLICABLE SPECIFICATION	X	X	-	X	-	X	X
5	LOOSE LINER OR OUTER PLY LAP THAT CAN BE REWORKED BY TRIMMING OR USE OF ADHESIVES MAINTAINING MINIMUM BOND PERMITTED BY APPLICABLE SPECIFICATION	X	X	X	X	-	-	-
6	EDGE LOOSENESS ON REINFORCEMENT, ATTACHING STRAPS, CHAFING STRIPS, TABS, ETC.	X	X	X	X	-	-	X
7	COATING OF EXPOSED FABRIC EDGES AFTER CURE, PROVIDED FABRIC IS NOT DAMAGED. EXPOSED FABRIC EDGES ARE ACCEPTABLE.	X	X	X	X	-	-	X
8	BLISTERS BETWEEN LINER OR OUTER PLY AND FITTING FLANGES	X	X	X	X	-	X	X
9	DAMAGED GROMMETS IN ACCESSORIES	X	X	X	X	-	-	X
10	DAMAGED COATING ON METAL, RUBBER, OR WOOD ACCESSORIES	X	X	X	X	-	-	X
11	IMPROPER OR LACK OF IDENTIFICATION MARKING, EXCEPT REPLACEMENT OF CEMENTED LABELS	X	X	X	X	-	-	X
12	SKIM COAT BLISTERS	X	X	X	-	-	-	X
13	SKIM COAT OFF OUTER PLY, PROVIDED CORDS OR FABRIC NOT DAMAGED	X	X	X	-	-	-	X

NOTE:

1/ Correction of the items listed in this table are normal finishing operations and are not counted as a defect or rework when completed. See table II for defects that do not require rework.

TABLE I. Fluid cell finishing operations. 1/ - Continued.

No	Defects	Bladder Tanks	Self Sealing Tanks	Tank Exterior	Tank Interior	Replacement Fittings	Installed Fittings	Crash Resistant Tanks
14	MISSING BLEEDER PATCH	X	X	X	-	-	-	X
15	MISSING OR MISLOCATED TRIM TAPE	X	X	X	-	-	-	X
16	RUST OR DIRT IN THREADS OR DEFECTIVE THREADED INSERTS	X	X	X	X	X	X	X
17	METAL FINISH DAMAGE	X	X	X	X	X	X	X
18	BENT FITTINGS THAT CAN BE STRAIGHTENED WITHIN STRESS LIMITATIONS	X	X	X	X	X	X	X
19	FLASH ON FITTING FLANGE TIPS, INSIDE DIAMETERS, THROUGH HOLES, ETC.	X	X	X	X	X	X	X
20	TEARS IN FITTING FLANGES THAT CAN BE TRIMMED WITHOUT VIOLATING APPLICABLE SPECIFICATION MINIMUM FLANGE LENGTH	X	X	X	X	X	X	X
21	DEFECTS SUCH AS MOLDING MARKS, CUTS, OR DEPRESSIONS THAT CAN BE CORRECTED BY BUFFING AND STILL MAINTAIN SPECIFICATION TOLERANCES	X	X	-	-	X	X	X
22	EXPOSED FABRIC CORDS THAT CAN BE CORRECTED BY SEAL COATING PROVIDED FABRIC IS NOT DAMAGED	X	X	X	--	X	X	X

NOTE:

1/ Correction of the items listed in this table are normal finishing operations and are not counted as a defect or rework when completed. See table II for defects that do not require rework.

TABLE II. Acceptance standards. 1/

Crash Resistant Tanks	Self Sealing Tanks	Bladder Tanks	Tank Interior	Tank Exterior	Installed Fittings	Replacement Fittings	Defect	Minor	Major	Critical
X	X	X	X	-	-	-	1. AREAS OF NONADHESION OR BLISTERS BETWEEN INNER LAPS			
							a. 0.25 inch maximum dimension (.50 inch for crash resistant cells) - Average 1 per 5 linear ft. of splice with maximum of 5 in any one 5 ft. length of splice	X	-	-
							b. Areas in excess of 1.a.	-	X	-
X	X	X	X	-	-	-	2. BLISTERS BETWEEN PLYS OR BETWEEN INNER LINER AND SEALANT			
							a. 1 inch maximum dimension	X	-	-
							b. Blisters between plys in excess of 2.a.	-	X	-
X	X	X	X	X	X	-	3. BLISTERS BETWEEN FITTING FLANGE AND ADJACENT PLY			
							a. 0.25 inch maximum dimension - Maximum of 1 in any 1 linear ft. of flange, or maximum of 1 per fitting when flange is less than 1 linear ft	X	-	-
							b. In excess of 3.a.	-	X	-
X	X	X	X	X	-	-	4. BLISTERS BETWEEN ATTACHMENTS AND OUTER OR INNER PLY			
							a. Not exceeding 15% looseness provided a continuous bond at least 0.25 inch wide is maintained around edge except at step-off where item 8 applies.	X	-	-
							b. In excess of 4.a.	-	X	-
X	X	X	X	X	-	-	5. CHANNELS BETWEEN PLIES AT BURIED EDGE OF LAP SPLICES AND IN TRANSITION AREA, ENTIRE LENGTH OF SPLICE			
							a. In excess of 0.25 inch in width	-	X	-
							b. In excess of 0.375 inch in width for crash resistant tanks	-	X	-
X	X	X	X	X	X	-	6. CHANNEL AROUND ENTIRE OUTER EDGE OF FITTING FLANGE			
							a. In excess of 0.25 inch in width	-	X	-
							b. In excess of 0.50 inch in width for crash resistant tanks	X	-	-

NOTE:

1/ Unless otherwise specified in the applicable detail specification a one inch minimum effective bond is maintained. Defects violating the applicable minimum bond requirement are classified as a major defect.

TABLE II. Acceptance standards [1/] - Continued.

Crash Resistant Tanks	Self Sealing Tanks	Bladder Tanks	Tank Interior	Tank Exterior	Installed Fittings	Replacement Fittings	Defect	Minor	Major	Critical
X	X	X	X	X	X	X	7. CHANNEL AROUND ENTIRE THROAT OF FITTING FLANGE			
							a. Up to 0.25 inch in width	X	-	-
							b. In excess of 7.a.	-	X	-
							c. In excess of .50 inch in width for crash resistant cells	-	X	-
X	X	X	X	X	-	-	8. CHANNELS AT FABRIC COMPONENTS			
							a. 0.25 inch maximum dimension - Maximum of 1 in any 1 linear ft	X	-	-
							b. In excess of 8.a.	-	X	-
							c. In excess of 8.a. and 8.b. for crash resistant tanks	-	X	-
X	X	X	X	-	-	-	9. OPEN END CHANNELS IN 3 PLY-LINER OVERLAPS OR TAILORED CORNERS			
							a. Less than 0.25 inch wide by 3 inches long and less than 1 inch bond maintained between end of channel and barrier. (N/A if 1" bond is maintained)	X	-	-
							b. In excess of 0.25 inch wide by 3 inches long	-	X	-
X	-	X	X	-	-	-	10. FRIED OR SCARRED CONDITION OR THINNING OUT OF GUM INNER LINERS IN BLADDER TANKS			
							a. Less than one-half of thickness	X	-	-
							b. In excess of one-half of specified thickness of liner	-	X	-
X	X	-	X	-	-	-	11. FRIED OR SCARRED CONDITION OR THINNING OUT OF GUM INNER LINER IN SELF-SEALING TANKS - In excess of one-half of specified liner thickness (less than one-third - no defect)	-	X	-
X	X	X	X	-	-	-	12. CUTS OR HOLES IN INNER LINER RESULTING FROM IMPROPER TOOLS OR USE OF TOOLS OR ANY REASON (gum or fabric innerliner) [2/]	-	-	X
X	-	X	X	-	-	-	13. LUMPS, CRATERS OR FOREIGN MATERIALS IN BLADDER CELL GUM INNER LINERS			
							a. Up to one-half of specified liner thickness	X	-	-
							b. In excess of one-half of thickness	-	X	-

NOTES:

1/ Unless otherwise specified in the applicable detail specification a one inch minimum effective bond is maintained. Defects violating the applicable minimum bond requirement are classified as a major defect.

2/ This item not applicable to stand or dissection test. See tables III & IV.

TABLE II. Acceptance standards 1/ - Continued.

Crash Resistant Tanks	Self Sealing Tanks	Bladder Tanks	Tank Interior	Tank Exterior	Installed Fittings	Replacement Fittings	Defect	Minor	Major	Critical
X	X	-	X	-	-	-	14. LUMPS, CRATERS OR FOREIGN MATERIALS IN SELF-SEALING CELL GUM INNER LINERS			
							a. Up to one-half of specified liner thickness	X	-	-
							b. In excess of one-half of specified liner thickness	-	X	-
X	X	X	X	X	-	-	15. SEPARATION OF CEMENTED COMPONENTS (CHAFING, STRIPS, TABS, ETC.) IN EXCESS OF 15% TOTAL AREA	-	X	-
X	X	X	X	X	-	-	16. DELAMINATION OR SEPARATION BETWEEN ANY TWO PLIES OR BETWEEN LINER AND ADJACENT PLY			
							a. 1 inch maximum dimension; not to exceed average of 1 per 5 sq. ft area; maximum of 5 in any one 5 sq. ft area; minimum of six inch solid bond between delaminations	X	-	-
							b. In excess of 16.a.	-	X	-
X	X	X	-	X	-	-	17. EXTERNAL DIMENSIONS OF CELL OUT OF TOLERANCE	-	-	X
X	X	X	X	X	X	-	18. FITTING MISLOCATED OR FITTING ROTATED BEYOND SPECIFIED TOLERANCE	-	-	X
X	X	X	X	X	-	-	19. LAP SPLICE EDGE LOOSENESS			
							a. Up to 0.125 inch in width and 3 inches long; no more than 1 per 5 linear ft and rework can be made by trimming	X	-	-
							b. In excess of 19.a. or if rework cannot be made by trimming	-	X	-
X	X	X	-	X	-	-	20. OUTER PLY CUTS OR SPLITS PARALLEL TO CORDS IF CORDS ARE NOT DAMAGED	X	-	-
X	X	X	X	X	X	-	21. LOOSENESS UNDER HANGER FITTINGS INCORPORATING METAL OR FIBER PLATES OR METAL RINGS, IN EXCESS OF THE CONTACT SURFACE AREA OF THE PLATES AND RINGS AND UP TO 0.25 INCH BEYOND OUTER EDGE OF PLATE OR RING	X	-	-
X	-	-	-	-	-	X	22. BLISTERS IN FLANGE AREA OF REPLACEMENT FITTINGS	-	X	-
X	X	X	X	X	X	X	23. MOLD MARKS IN FLANGE AREA OF FITTING			
							a. No interference with design characteristics of fitting	X	-	-
							b. Sufficient to cause interference	-	X	-
X	X	X	X	X	X	X	24. FLOW CRACKS, LAMINATIONS, POROUS AREAS OR BACK RINDS IN EXCESS OF HALF INCH BODY THICKNESS OF FITTING FLANGE AT LOCATION OF DEFECT	-	X	-

NOTE:

1/ Unless otherwise specified in the applicable detail specification a one inch minimum effective bond is maintained. Defects violating the applicable minimum bond requirement are classified as a major defect.

TABLE II. Acceptance standards 1/ - Continued.

Crash Resistant Tanks	Self Sealing Tanks	Bladder Tanks	Tank Interior	Tank Exterior	Installed Fittings	Replacement Fittings	Defect	Minor	Major	Critical
X	X	X	X	X	X	X	25. FOREIGN MATERIAL IN FITTING FLANGE			
							a. 0.031 inch or less	X	-	-
							b. Over 0.031 inch but less than one half of body thickness at defect	-	X	-
							c. In excess of 25.b.	-	-	X
X	X	X	X	X	X	X	26. TEARS IN FITTING FLANGE			
							a. If fairing can be accomplished while still maintaining specified minimum flange width	X	-	-
							b. In excess of 26.a.	-	X	-
X	X	X	X	X	X	X	27. CUTS OR NICKS IN FITTING FLANGE			
							a. 0.031 inch or less	X	-	-
							b. Over 0.031 inch but less than one-half of body thickness at defect	-	X	-
							c. Greater than one-half of body thickness	-	-	X
X	X	X	X	X	X	X	28. EXPOSED FABRIC IN FITTING FLANGE			
							a. With no damaged cords. Cords exposed at edge of fitting flange are permitted.	X	-	-
							b. With damaged cords	-	X	-
X	X	X	X	X	X	X	29. BLISTERS IN FITTING FILET			
							a. Up to 0.125 inch	X	-	-
							b. In excess of 0.125 inch	-	X	-
X	X	X	X	X	X	X	30. CUTS OR CRACKS IN FITTING FILLETS	X	-	-
X	X	X	X	X	X	X	31. EDGE LOOSENESS BETWEEN FITTING FILLET AND FABRIC	X	-	-
X	X	X	X	X	X	X	32. EDGE LOOSENESS BETWEEN FITTING FILLET AND METAL	X	-	-
X	X	X	X	X	X	X	33. SEALING SURFACE OF FITTING ROUGHER THAN SPECIFICATION LIMITS	-	X	-
X	X	X	X	X	X	X	34. FITTING CRITICAL FLAT AREA FINISH, OTHER THAN SEALING SURFACE, ROUGHER THAN SPECIFICATION LIMITS	-	X	-
X	X	X	X	X	X	X	35. SCRATCHES, PITS OR MARS IN SEALING SURFACE BEYOND LIMITS OF SPECIFICATION	-	-	X

NOTE:

1/ Unless otherwise specified in the applicable detail specification a one inch minimum effective bond is maintained. Defects violating the applicable minimum bond requirement are classified as a major defect.

TABLE II. Acceptance standards 1/ - Continued.

Crash Resistant Tanks	Self Sealing Tanks	Bladder Tanks	Tank Interior	Tank Exterior	Installed Fittings	Replacement Fittings	Defect	Minor	Major	Critical
X	X	X	X	X	X	X	36. MOLDING FLASH ON SEALING SURFACE OF FITTING	-	-	X
X	X	X	X	X	X	X	37. FAULTY DOME NUT	-	X	-
X	X	X	X	X	X	X	38. THREAD DIMENSIONS OUT OF TOLERANCE	-	X	-
X	X	X	X	X	X	X	39. CORROSION, DIRT, METAL FINISH DAMAGE OR LACK OF SPECIFIED PROTECTIVE COATING	-	X	-
X	X	X	X	X	X	X	40. "O" RING GROOVE WIDTH OR DEPTH, FITTING FLATNESS, THICKNESS I.D. OR BOLT HOLE DIMENSIONS OUT OF TOLERANCE	-	X	-
X	X	X	X	X	X	X	41. BENT FITTING			
							a. Can be straightened within stress limits of metal	-	X	-
							b. Cannot be straightened within stress limits of metal	-	-	X
X	X	X	-	-	-	X	42. BUFFING THROUGH FABRIC INNER LINER	-	-	X
X	X	X	X	-	-	X	43. ANY CONDITION CAUSING EXPOSED FABRIC; NO DAMAGE OF FABRIC INNER LINER	X	-	-
X	X	X	-	-	-	X	44. FABRIC COATING BLISTERS OF FABRIC INNER LINERS	X	-	-

NOTE:

1/ Unless otherwise specified in the applicable detail specification a one inch minimum effective bond is maintained. Defects violating the applicable minimum bond requirement are classified as a major defect.

TABLE III. Additional criteria for stand tested cells. 1/, 2/

TYPE OF TANK			DEFECT	DEFECT CLASS		
CRASH RESISTANT	SELF SEAL	BLADDER			MAJOR	CRITICAL
X	X	X	1. Stain or activation due to deterioration of cell	-	-	X
X	X	X	2. Stain or activation due to design failure	-	-	X
X	X	X	3. Stain or activation due to manufacturing defect	-	-	X
X	X	X	4. Stain or activation due to manufacturing damage or rework damage	-	-	X
X	X	X	5. Stain or activation due to mishandling or improper cell installation			
			a. Condition of cell does not preclude complete evaluation of cell	No Defect		
			b. Condition precludes complete evaluation	Retest		
X	X	X	6. Activation anywhere in the cells	-	X	-

NOTES:

1/ Following stand test, the above inspection standards shall apply in addition to the acceptance standards of table II.

2/ If it is impossible to determine source of stain by thorough engineering and laboratory tests, excluding dissection, a stain of 1 inch maximum diameter or equivalent area is allowable, provided there is not more than one such stain per 150 sq. ft. of cell area.

TABLE IV. Additional criteria for dissection tested cells. 1/

APPLICABLE TO		DEFECT	DEFECT CLASS		
SELF SEAL TANK	BLADDER TANK		MINOR	MAJOR	CRITICAL
X	X	1. Adhesion of inner liner to sealant or adjacent ply in flat panel areas is less than 6 lb. per inch of width 2/	-	X	-
X	X	2. Adhesion of inner liner to chafing strips less than 6 lb. per inch of width 2/	-	X	-
X	X	3. Adhesion of fitting flange to inner ply less than 6 lb. per inch of width 2/	-	X	-
X	X	4. Adhesion of inside and outside accessories less than design values 2/	-	X	-
X	X	5. Dissection of fitting flange indicates construction is not in accordance with approved manufacturing specification	-	X	-
X	X	6. Adhesion of fabric fitting flanges to metal ring less than 150 lb per inch of width. This factor also used for sampling tests of replacement fittings 2/, 3/	-	X	-

NOTES:

1/ Following dissection test, the above inspection standards shall apply in addition to the standards of table II.

2/ Test Method: ASTM-D751, Dry Pull at 2 inches per min.

3/ Failure of fabric flange prior to adhesion failure does not constitute defect.

TABLE V. Summary.

PURPOSE OF INSPECTION	APPLICABLE TABLE	ACTION TO BE TAKEN WITH DEFECTIVE ITEMS		
		MINOR DEFECT	MAJOR DEFECT	CRITICAL DEFECT
Production cells submitted for acceptance	Table II	Cells with minor defects are acceptable without rework provided the defects do not exceed the limits noted in 5.3.1.a, b, & c. If these limits are exceeded, they will be treated as major defects.	All major defects must be corrected using an approved rework procedure prior to acceptance.	Cells with critical defects will be rejected. The cell will be scrapped unless the manufacturer proposes a rework procedure acceptable to the acquiring activity.
Replacement production fittings submitted for acceptance.	Table II	Fittings with minor defects are acceptable without rework provided the defects do not exceed the limits noted in 5.3.1.d. If these limits are exceeded, they will be treated as major defects.		
Inspection of cells subjected to stand test or dissection test	Table II & either Table III or Table IV as applicable	Test results will be considered satisfactory if minor defects do not exceed limits listed in applicable portion of 5.3.1. If limits are exceeded, they will be treated as major defects.	When major defects are identified, production items may be given approval provided it can be shown that this is a unique case. If it is not a unique case, all like defects in production cells will be reworked. Lot represented by test is then acceptable. Take appropriate action to prevent repetition of defect.	When a critical defect is identified, test is considered unsatisfactory. Notify prime contractor and acquiring activity. All production represented by test shall be inspected to determine if this is a unique case and must be found free of this defect prior to acceptance. If this is a unique case, test cell may be reworked, if possible, utilizing approved procedures. If not a unique case, action shall be taken to determine if defective cells can be reworked and the defect shall be corrected in future production.
Replacement fittings subjected to dissection test.	Table II & Item 6 of Table IV			

CONCLUDING MATERIAL

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

Review activities:
Air Force - 82
Navy - Marine Corps
Army - AT

Preparing Activity:
Navy - AS
(Project 4730-0496)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.
   NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-HDBK-806	2. DOCUMENT DATE (*YYMMDD*) 9 October 1996

3. DOCUMENT TITLE
Inspection and Acceptance Standards for Propulsion Fluid Cells and Fittings

4. NATURE OF CHANGE (*Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.*)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (*Last, First, Middle Initial*)	b. ORGANIZATION	
c. ADDRESS (*Include Zip Code*)	d. TELEPHONE (*Include Area Code*) (1) Commercial: (2) DSN: (*If Applicable*)	7. DATE SUBMITTED (*YYMMDD*)

8. PREPARING ACTIVITY

a. NAME COMMANDER NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION	b. TELEPHONE NUMBER (*Include Area Code*) (1) Commercial (908) 323-7488 (2) DSN 624-7488
c. ADDRESS (*Include Zip Code*) CODE 414100B120-3 HIGHWAY 547 LAKEHURST, NJ 08733-5100	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office, 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 DSN 289-2340