

FED. SUPPLY CLASS

TWIN SEAPLANE FLOATS

SPECIFICATION

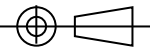


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1. INTRODUCTION

This specification defines the minimum airworthiness requirements for twin seaplane floats suitable for use on airplanes.

2. TYPES

This specification provides design criteria for twin seaplane floats for use on airplanes.

2.1 Landing gear for amphibious floats

For amphibious floats, landing gear must meet the applicable landing gear requirements, at an aircraft installation level, of 14 CFR part 23 or 25.

3. MATERIAL AND WORKMANSHIP

All materials used in the structure shall be of a quality which experience or tests have demonstrated to be suitable and dependable for use in aircraft floats and shall conform to specifications which will ensure their having the strength and other properties assumed in the design. All workmanship shall be consistent with high-grade aircraft float manufacturing practice.

3.1 Fabrication methods

The methods of fabrication employed in the construction of the float structure shall be such as to produce consistently sound structures. When a fabrication process requires close control to attain this objective, the process shall be one for which the suitability and dependability have been established on the basis of experience or tests.

Composite process specifications shall be developed anew by the float manufacturer or could be an existing industry or government created specification. The specifications should meet the following requirements, including but not limited to:

- Developed to control the manufacture of the part(s), and address in-process inspection or test requirements for quality assurance purposes.
- Provide a means by which process parameters and methods can be documented and communicated to the various organizations involved in the fabrication of the composite parts.
- Be clear and complete to ensure that the resulting parts are consistent in quality.

Guidance for developing a process specification and some examples of content can be found in Appendix A.

3.2 Composite materials

Each structural composite material used shall conform to a specification. The purpose of that specification is to ensure the composite materials used in production maintain consistency with the materials used in, or reflected by, the design data, the test articles used for material qualification and/or the proof-of-structure certification test article(s). These material specifications may be developed by the manufacturer, or may be existing specifications created and maintained by another party provided the specifications control the requisite material properties.

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The specifications shall meet the following non-exclusive list of requirements, intended to ensure the specifications' goal of composite raw material consistency:

- Inspection procedures and supplier controls shall be established
- Material acceptance limits shall be established

The float manufacturer will provide evidence that each production batch of material in each shipment meets the material specification requirements. This evidence will include test data, certificate of conformity, affidavits, etc., depending upon the float manufacturer's quality assurance plan and purchase contract requirements for a particular material.

A material specification for a composite material may require some unique content compared to specifications for other commonly used aerospace materials. See Appendix A for references and guidance regarding the content of a composite material specification.

3.2.1 Composite structural considerations

Experimental evidence should be provided to demonstrate that the material design values or allowables are attained with a high degree of confidence in the appropriate critical environmental exposures to be expected in service. The structural static strength substantiation of a composite design should include effects of environment, material and process variability, non-detectable defects or any defects that are allowed by the quality control, manufacturing acceptance criteria, and service damage allowed in maintenance documents of the end product. The static strength of the composite design should be demonstrated in the appropriate environment using one of the three approaches below:

- 1) In the first approach, the full scale static test should be conducted on structure conditioned to simulate the critical environmental exposure and then tested in that environment.
- 2) The second approach relies upon coupon, element, and subcomponent test data to determine the effect of environmental exposure on static strength. This characterization should be performed for all structural materials. The critical degradation characterized by these tests should then be accounted for in the full scale static strength demonstration test (e.g., overload factors), or in analysis of these results (e.g., showing a positive margin of safety with design values that include the degrading effects of environment). The necessary experience to validate an analysis may include previous ultimate load tests with similar designs, material systems, and load cases.
- 3) In practice, aspects of the first two approaches may be combined to get the desired result (e.g., a full scale static test may be performed at critical operating temperature with a load factor to account for moisture absorbed over the aircraft structure's life).

3.3 Standard fastenings

All bolts, pins, screws, and rivets used in the structure shall be of a type the suitability and dependability of which have been demonstrated by experience or tests. The use of a suitable and dependable locking device or method is required for all such bolts, pins, and screws. Self-locking nuts shall not be used on bolts subject to rotation.

3.4 Protection

All members of the structure shall be suitably protected against deterioration or loss of strength in service due to weathering, corrosion, abrasion, or other causes. Special precautions should be taken against corrosion from salt water, particularly where parts made from materials with different electronegativity potentials are in close proximity. Adequate provisions for ventilation and drainage of all compartments of the structure shall be made.

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