

SHIPPING CONTAINERS - AIRCRAFT ENGINES AND COMPONENTS

Issued 2-1-45
Revised

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I. PURPOSE: To provide general information on the construction and application of a type of container suitable for either domestic or export shipment of aircraft engines and components.

REAFFIRMED

II. MATERIALS AND APPLICATION:

MAY '95

A. Engine or Component Supporting Structure:

1. Timber.- All timber shall be clear grain wood dressed four sides and shall be in accordance with American Lumber Standards or the Lumber Association Standards applicable to this particular grade. Typical materials suitable for this application are clear yellow pine, spruce, oak, and douglas fir.
2. Plywood.- All plywood, flat or moulded, shall be in accordance with AMS 3920 for high density plywood or AMS 3922 for low density plywood and applied as herein described.
3. Steel.- Steel shall be fabricated with standard structural shapes and of sizes adequate to support the required load.

B. Framing:

1. Lumber.- All lumber shall be standard structural sizes dressed four sides and free of imperfections in accordance with American Lumber Standards or the Lumber Association Standards applicable to the material and grade specified.
2. Metal.- Framing shall be of standard structural shapes and of sizes adequate to support the required load.

C. Paneling: Panels shall be either match board, plywood, or composition material.

1. Plywood.- Plywood conforming to AMS 3922 for low density plywood shall be used in the construction of these panels.
2. Composition.- Composition sheet conforming to the requirements of AMS 3940 shall be used in the construction of these panels.
3. Match Board.- Match board shall conform to the following specifications:
 - a. Moisture content shall not exceed 18% of its oven dry weight.
 - b. The pieces shall be sound and free of all defects that materially weaken them or interfere with the prescribed nailing.
 - c. Otherwise conform with American Lumber Standards or the Lumber Association Standards applicable to the material and grade specified.

D. Roofing and Flooring: These sections may be of matched board, plywood or composition material as specified in Section IIC. The use of galvanized sheet is also permissible.

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E. Skids: Long grain yellow pine, spruce, and ash or standard structural steel shape as required shall be used.

F. Sheathing Paper: Asphalt impregnated or tarred paper weighing not less than 28 lbs./100 sq.ft. shall be applied to the matched board sheathing in the manner specified by paragraph III F 1. The paper shall be thoroughly water proofed, so that a receptacle made from a single piece will hold water for 24 hours. The tensile strength of the paper shall be not less than 20 pounds per inch width. The paper shall show no bleeding of asphalt when heated to 180°F for five hours. By bleeding is meant exudation of the asphalt through the surface of the paper.

G. Inspection Ports:

1. AS 340 Inspection Port Cover.

2. AS 339 Inspection Port Cover and Log Data Holder.

H. Hardware: The selection, quantity, and use of bolts, nuts, screws, washers, nails, lifting handles, steel banding, and other fastening will be dependent on the strength requirements of the case under construction. The recommendations under Section III are considered a minimum requirement.

III. CONSTRUCTION REQUIREMENTS: In the design of a shipping container consideration shall be given to weight for economy in transportation; accommodations as provided by standard box car dimensions, air freight restrictions, motor vehicle and highway restrictions; location of center of gravity to prevent overturning; availability of materials, and possible damage to moisture barrier enveloping the engine. The shipping container sections shall be so designed that they may be assembled and secured by the use of suitable fastenings, so that the complete container can be disassembled and re-used.

A. Engine or Component Supports: This structure shall be capable of withstanding an imposed load equivalent to five times the weight of the engine or component part.

B. Imposed Loads: The top and supporting structure of the container shall be designed to support a superimposed load of 175 lbs./per sq. ft.

C. Clearance: All panels shall be so supported or of sufficient rigidity that the deflection will not exceed $1/2$ the inside clearance between the engine and the container walls when a load of 400 lbs. is imposed at a point represented by the intersection of the panel diagonals.

D. Skids: A minimum of two skids shall be provided on the bottom platform of the container so located as to contribute to the engine support structure strength. The skids shall be of such depth as to provide a minimum clearance of $2\frac{1}{2}$ " between the underside of the platform and the floor. Ends of skids may be beveled to a depth of not more than $1/2$ the thickness of the skids.