U.S. Department of Transportation
**Federal Aviation Administration**

# Advisory Circular

**Subject:** PRODUCTION UNDER TYPE CERTIFICATE ONLY
**Date:** 7/1/82
**Initiated by:** AWS-200
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**Change:**

1. PURPOSE. This advisory circular provides information concerning Subpart F of Federal Aviation Regulations (FAR) Part 21 and sets forth an acceptable means, not the sole means, of compliance with its requirements.

2. CANCELLATION. Advisory Circular 21-6, Production Under Type Certificate Only, dated May 26, 1967.

3. RELATED FEDERAL AVIATION REGULATIONS. FAR Part 183

4. DEFINITIONS. As used herein, the following definitions apply:

a. Manufacturer. The holder or licensee of a type certificate, producing duplicate products in accordance with FAR Part 21, Subpart F.

b. Supplier. Any person who furnishes articles or services related to the manufacture of type certificated products.

c. Article. A material, part, component, assembly or appliance which is used in the type certificated product, as specified in the type design data.

d. Aircraft Certification Office (ACO). The office that administers the type certificate and production approval of products in the area where the manufacturer is located.

e. District Office. The FAA Manufacturing Inspection District Office (MIDO) responsible for the evaluation and the inspection of the manufacturer's facilities.

5. DISCUSSION. This advisory circular covers only those sections of FAR Part 21, Subpart F, where further discussion, information, or examples would be helpful. The headings of each of the following main paragraphs refers to the applicable section of Subpart F.

a. FAR 21.121 Applicability. The term "production under a type certificate only" refers to the production of a product by a type certificate holder or his licensee without related production certificate.

b. FAR 21.123 Production Under Type Certificate.

(1) A manufacturer who has been issued a type certificate (TC) is given six months under FAR 21.123(c) to establish and implement a production inspection system, unless the manufacturer has applied for a production certificate under FAR 21, Subpart G. During the six (6) month period from the date of issuance of the TC each completed product or part thereof is subject to FAA inspection prior to the issuance of airworthiness certificates. Because of limited monetary and manpower resources, these inspections may be delayed and/or very time consuming, and would normally allow a very low production rate by the manufacturer. It is, therefore, to the manufacturer's advantage to develop and implement an approvable production inspection system as quickly as possible. As the manufacturer's individual fabrication, assembly, and inspection operations are found to be in compliance with the regulations, they may be FAA approved on a progressive basis. When areas are found to be in compliance, the FAA may thereafter reduce its inspection and increase its reliance on the manufacturer's production inspection system. When the total production inspection system has been found in compliance with the regulations, the cognizant ACO will issue the letter of approval of the production inspection system. Subsequent FAA inspections will be for the purpose of surveillance of the approved system to determine continued compliance.

(2) Upon the estblishment of the production inspection system, FAR 21.123(d) requires the manufacturer to submit to the FAA a manual that describes the system and the means of making the determinations required by FAR 21.125(b). The local FAA Manufacturing Inspection District Office (MIDO) will evaluate the manual to determine whether the contents are adequate and provide a clear, completed description of the various systems, tests, procedures, records, and forms which will be the means for compliance with FAR 21.125 through 21.130. When the manual is considered acceptable, the district office will conduct a physical inspection of the various areas of the production inspection system.

(3) In the event a manufacturer does not establish and implement a production inspection system within six (6) months from the date of issuance of the TC, the manufacturer may request an extension of the time period when there are unusual or extenuating circumstances that would preclude the establishment of the production inspection system. A request for the extension may be made to the Regional Director of the Aircraft Certification Directorate. The request should include information, views, and arguments to substantiate that the reason for the extension was unavoidable. If the manufacturer does not establish and implement a production inspection at the end of the six (6) month period, and there are no extenuating circumstances to preclude the establishment and implementation, the FAA will discontinue inspections until an approvable system has been established.

c. FAR 21.125 Production Inspection System: Materials Review Board. The basic requirements for the production inspection system and materials review board are generally self-explanatory as outlined in FAR 21.125, and the following paragraphs provide an example of acceptable compliance:

(1) Materials Review Board. An effective materials review board is of primary importance in the functioning of an efficient production inspection system since it controls the inspection, identification, rework, and use of damaged or nonconforming articles, including the isolation or scrapping of unusable articles. The functions of the board are to determine that:

(a) Appropriate data is submitted to the FAA for engineering approval, when a materials review board decision results in a change to the product (reference FAR Part 21, Subpart D).

(b) Provisions are made for appropriate corrective action to preclude recurrences of discrepancies when the nonconforming, or otherwise unsatisfactory, articles result from deficiencies in manufacturing procedures, processes, design, or any other condition.

(c) The records required to be maintained are periodically reviewed and evaluated to determine the effectiveness of the corrective action program and to reveal problem areas as they arise.

(2) Suppliers. The system established for control of incoming materials and bought or subcontracted parts should provide for inspections and tests of such articles at the supplier's facility by the manufacturer, if the articles cannot or will not be completely inspected upon receipt at the manufacturer's plant.

(3) Storage and Issuance. A reliable, well-controlled storage and issuance system, for articles used in the product, is a major factor in manufacturing a conforming and safe product. Some of the objectives of such a system are to ensure that:

(a) Articles in storage are adequately protected, segregated, and identified;

(b) Articles subject to deterioration from prolonged storage are periodically reinspected and disposed of as required;

(c) Articles being delivered to, or stored in fabrication or shipping areas are protected from damage;

(d) All applicable design changes are incorporated prior to release of stored articles for installation in the product;

(e) Only those articles which are identified as having passed company inspection are received into and issued from finished stores.

(4) Processes. The production inspection system should be designed to ensure that each process or related service is performed by trained and qualified personnel, and that temperatures, solutions, curing times, or any other critical factors and equipment are periodically inspected, and that the inspections are documented. These processes or related services are accomplished to United States or recognized industry specifications when deemed appropriate for the particular application. (Examples: Military specification, MIL-H-6088, "Heat Treatment of Aluminum Alloys," Federal specification,

QQ-P-416, "Electro-deposition of Cadmium Plate," Aerospace Material specification, AMS 2410, "Silver Plating, Nickel Strike, High Bake," etc.)

(5) Planning. The following paragraphs provide an example of an acceptable means of compliance with FAR 21.125(b)(5), which entails the establishment of a planning system that will ensure all required inspections and tests are conducted in the proper sequence, when articles and processes are in an inspectable condition, as established by fabrication and inspection instructions, shop travelers, check lists, or similar media. Such a planning system should provide for the establishment and control of inspection procedures which would ensure that each article used in the product is inspected for conformity to the type design. The production inspection system should provide for:

(a) Classification of design characteristics and related manufacturing characteristics of all articles, processes, services, and the completed product, so that the most effective fabrication inspection methods and process controls would be used with respect to critical and major characteristics and defects.

(b) Selection of appropriate inspection methods and plans for each classification to assure that all characteristics affecting safety will be inspected, and reinspected as required, to assure conformity to approved design data.

(c) Selection and control of statistical quality control methods used on noncritical characteristics to assure that any nonconformities or defects which may be in a lot accepted under statistical quality control methods will not result in an unsafe condition in an end product or spare part.

(6) Inspection Stations. An effective production inspection system should provide for inspection stations at each major stage of production, maintain data, technical material, and records which may be required in the performance of inspections or tests at that particular stage of production. To ensure that all articles, processes, procedures, and the complete products are properly inspected, it is also normal procedure to employ a sufficient number of appropriately qualified inspectors to ensure that all required inspections can be methodically performed, with no undue pressure arising because of production schedules.

(7) Inspection Status. Articles will be identified with stamps or marks traceable to the individual inspector, properly controlled to ensure that only articles which have been inspected and accepted are used in the finished product. For example:

(a) Suitable acceptance, rework, or rejection stamps should be placed on articles subjected to processing, testing, and inspection. Such stamps should be applied to articles subjected to heat-treating, welding, soldering, brazing, bonding, hardness tests, proof testing, laboratory analysis, radiographic inspection, ultrasonic inspection, magnetic particle inspection, etc.

(b) Articles which have been reworked and accepted as a result of materials review action must be so identified by a suitable stamp.

(c) Articles rejected as being unusable or scrap must be plainly marked and subsequently controlled so as to absolutely preclude their installation on the product or their use as spare parts.

(8) Tool and Gauge Control. An important function of a production inspection system is to provide for the inspection and the calibration, to certified measurement standards, of all inspection tools, gauges, testing equipment, as well as production jigs, fixtures, templates, etc., which are depended upon as media for acceptance. An effective schedule should have the inspection intervals established on the basis that such tools and gauges are inspected prior to their becoming inaccurate, to ensure timely adjustment, replacement, or repair. A record keeping system should ensure that:

(a) Each piece of equipment is checked prior to first usage and at the proper periodic interval, and marked to indicate the date the next inspection is due;

(b) Each piece of equipment is removed from inspection and shop areas or conspicuously identified to preclude usage after expiration of the inspection due date; and that,

(c) Calibration standards are traceable to the U.S. National Bureau of Standards.

d. FAR 21.127 Tests: Aircraft.

(1) Prior to production flight test of aircraft any items coming under the provisions of Section 21.127(b)(5) should be checked. For example, it is important that:

(a) The means provided to level the aircraft are accurate and in conformity with type design data.

(b) Each aircraft is weighed to determine that the empty weight and center of gravity is in conformity with the type design data.

(2) The flight test procedure and flight check-off form, required to be established and approved under FAR 21.127, should be submitted to the FAA Aircraft Certification Office for approval, and may be included in the descriptive data discussed under paragraph 5b(2).

e. FAR 21.128 Tests: Aircraft Engines.

(1) The test equipment used for the test runs should be capable of output determinations of accuracy sufficient to assure that the engine output delivered complies with the official ratings and operating limitations.

(2) Following the tests prescribed by FAR 21.128, each engine is subject to inspection by the FAA to determine that the engine is in condition for safe operation. Such inspection may also include internal inspection and examination to ensure that no unsafe condition exists. The degree of internal inspections will normally be determined by the cumulative results

of such inspections conducted on the first production engines, and by service experience. The FAA may consider a statistical plan for internal engine inspections if the manufacturer submits a proposal based on product uniformity, a satisfactory history of previous internal inspections, and service experience.

f. FAR 21.129 Tests: Propellers.

(1) An acceptable functional test for variable pitch propellers would include 25 complete cycles of the control throughout the propeller pitch and rotational speed ranges. In addition, for feathering and/or reversing propellers, there should be accomplished five cycles of feathering operation and five cycles of reversing operation from the lowest normal pitch to the maximum reverse pitch.

(2) Following the functional test, each propeller is subject to inspection by the FAA in a similar manner as that described for engines in paragraph 5e(2) of this circular.

g. FAR 21.130 Statement of Conformity. Upon receipt of the statement of conformity, the FAA will inspect the completed product to determine that it conforms to the type design and is in condition for safe operation. If so, an airworthiness certificate will be issued for aircraft, or an Airworthiness Approval Tag, FAA Form 8130-3, will be issued for an engine or propeller.

h. General.

(1) Identification of Replacement Parts. Approved replacement parts may be identified:

a. With an FAA Form 8130-3 (Formerly FAA Form 186), Airworthiness Approval Tag. An Airworthiness Approval Tag identifies a part or group of parts that have been approved by authorized FAA representatives, or

b. With a shipping ticket, invoice, or other document which provides evidence that the part was produced by a manufacturer holding an FAA Approved Production Inspection System issued under FAR Part 21, Subpart F.

c. Such parts produced, which are not accompanied by either of the above listed items, are not considered to be FAA approved parts.

(2) Designated Manufacturing Inspection Representatives. Following approval of the production inspection system, the manufacturer may obtain the appointment of individuals in his employ as Designated Manufacturing Inspection Representatives (DMIR) for the purpose of issuing airworthiness certificates and/or airworthiness approval tags. (Reference FAR Part 183).

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