



# ADVISORY CIRCULARS

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## **Self-manufactured Tools and Equipment by Maintenance Organization**

Flight Standard Department

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## General Administration of Civil Aviation of China

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### **Title: Self-manufactured Tools and Equipment by Maintenance Organization**

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#### **1. Basis and Purpose**

This advisory circular is established on the basis of Approval of Civil Aircraft Maintenance Organization (CCAR-145-R2) issued on Dec.21<sup>st</sup>, 2001. It aims at providing guidance for maintenance organizations on how to meet CCAR-145's requirements when self-manufacturing tools and equipment.

#### **2. Applicability**

This advisory circular is applicable to all maintenance organizations.

#### **3. Cancellation**

Intentionally left blank

#### **4. Explanations**

Though generally the maintenance organization shall use the tools/equipment suggested in the Airworthiness data provided by Manufacturers, self-manufactured tools/equipment can be used while necessary. Some of them are manufactured in accordance with the design data provided by the manufacturers, and some of them are manufactured as a substitute while without Manufacturer's design data. This AC aims at providing different requirements accordingly in various cases so as to satisfy the requirements of CCAR-145.

It is not meant that self-manufactured tools/equipment are designed and manufactured internally by one Maintenance Organization. Self-manufactured tools/equipment is those used for their own purposes. The maintenance

organization shall be fully responsible for design, manufacturing and management of those self-manufactured tools/equipment. Self-manufactured tools/equipment can not be sold.

## 5. Definition

**General tools/equipment:** Tools/equipment not specially suggested by manufacturers, but the size, accuracy and scale range of them required by Manufacturers.

**Special tools/equipment:** Tools/equipment recommended in manufacturers' technical data, only for maintaining designated aircraft or its component. They are used only in maintenance process, not used for determining the return to service of aircraft or its component.

**Test equipment:** Tools/equipment recommended in manufacturer's technical data, used for maintaining aircraft or its component, also used for determining the final return to service of aircraft or its component.

## 6. Basic principle for self-manufactured tools/equipment

6.1 General tools/equipment cannot be self-manufactured. Only those tools/equipment manufactured under special quality system approved by designated authority can be purchased.

6.2 Principle for self-manufacturing special tools/equipment:

- (1) Only those tools/equipment manufactured in accordance with the design data provided by the Manufacturers of aircraft or its component, meeting manufacturing standards and manufacturing files of them established, can be put into use under the approved certification procedure.
- (2) Self-manufactured tools/equipment recommended by aircraft or its component manufacturers, but design data of them not provided, must meet design & manufacturing standards required by this AC, and must be approved by the regional Administration of CAAC after establishing the Operational Manuals and files which meet relevant requirements given by this AC.
- (3) The self-manufactured tools/equipment for the purpose of improving maintenance efficiency and safety, which are not required by aircraft or its component Manufacturers, can be put into use by Maintenance

Organizations in accordance with its approved certification procedures, provided they meet design , manufacturing standards required by this AC after establishing the Operational Manuals and files which meet relevant requirements

#### 6.3 Principles for self-manufacturing test equipment:

(1) Tools/equipment self-manufactured in accordance with the design data provided by aircraft or its component manufacturers, while meeting the manufacturing standards and their files set up, can be approved by regional Administration of CAAC after certified according to the approved certification procedures.

(2) Self-manufactured test equipment recommended by the aircraft or its component Manufacturers but design data not provided, shall meet the design and manufacturing standards required by this AC. They can be approved by the Agency authorized by CAAC after operational manuals and files of them established.

### **7. Design, Manufacturing and Management of Self-manufactured Tools/equipment**

7.1 Self-manufactured tools/equipment must be designed and manufactured in accordance with the technical standards accepted by CAAC. Due to the usage and specialty of the tools/equipment for aviation maintenance, CAAC will only accept those self-manufactured tools/equipment designed and manufactured in accordance with the State Standards of P.R China, Aviation Standards or Military Standards. After confirmation, CAAC will also accept those manufactured in accordance with standards higher than the above-mentioned standards.

7.2 The following requirements must be met while designing and manufacturing the self-manufactured tools/equipment:

(1) The principle and design drawings must be in compliance with the relevant State Standards;

(2) The raw materials for self-manufactured tools/equipment shall reach the

design limits of strength, rigidity and other parameters. The material that will directly contact with aircraft or its components must have no any negative influences to the contacted aircraft or its components;

- (3) The accuracy, scale range and stability of the instrument and indicators shall fulfill test requirements;
- (4) Power sources shall supply stable and adjustable power, while satisfying the test need;
- (5) Control system shall be easy in operation and have preventive mis-operation function;
- (6) Software for electronic and auto-control shall be in compliance with the State or Industry Standards;
- (7) The safety protection function of the tools/equipment shall be in compliance with the relevant State Standards.
- (8) Job cards and accomplishment instructions shall be available while manufacturing tools/equipment.
- (9) The qualification of the Organizations and concerned personnel shall be in compliance with the relevant State or Industry standards;
- (10) Before put into use, tools/equipment shall be tested in practice to prove that they have reached the standards defined in the relevant airworthiness data.

7.3 For the complex self-manufactured equipment, the operational Manuals shall be prepared and at least contain the following contents:

- (1) Explanation of principles;
- (2) Main functions and use;
- (3) Operation instruction;
- (4) Maintenance requirements and relevant instructions

7.4 Files of self-manufactured tools/equipment shall be set up and at least contain the followings:

- (1) Principles and design drawings
- (2) Manufacturing records
- (3) Practical test records
- (4) Maintenance records

(5) Records of faults occurring in usage

## **8. Approval of self-manufactured tools/equipment**

8.1 For all self-manufactured equipment as defined in Paragraph 6 of this AC, which are approved by a Maintenance Organization, the Maintenance Organization shall state all the Certification Procedures for Self-manufactured Tools/equipment in its approved Maintenance Organization Manuals. The self-manufactured equipment can only be certified under the above-mentioned Certifying Procedures.

8.2 For all self-manufactured equipment as defined in Paragraph 6 of this AC, which shall be approved by the Regional Administration of CAAC, the maintenance organization shall provide the compliance statement which shows that the requirements as defined in Paragraph 7 are met. The Regional Administration of CAAC will issue an approval letter if they are satisfied with the statement.

8.3 For the self-manufactured equipment as defined in Paragraph 6, which shall be approved by CAAC authorized Organizations, the maintenance organizations shall provide an Application letter for Approval to these organizations. The CAAC authorized organizations will issue a verification letter if being satisfied after audit.

## **9. CAAC Authorized Organization**

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