



Number: CTSO-C99a

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Approved by: Xu Chaoqun

China Civil Aviation Technical Standard Order

This China Civil Aviation Technical Standard Order (CTSO) is issued according to Part 37 of the China Civil Aviation Regulations (CCAR-37). Each CTSO is a criterion which the concerned aeronautical materials, parts or appliances used on civil aircraft must comply with when it is presented for airworthiness certification.

Flight Deck (Sedentary) Crewmember Protective Breathing Equipment

1. Purpose.

This China Technical Standard Order (CTSO) is for manufacturers applying for a CTSO authorization (CTSOA) or letter of design approval. This CTSO prescribes the minimum performance standards(MPS) that flight deck (sedentary) crewmember protective breathing equipment (PBE) must first meet for approval and identification with the applicable CTSO marking.

2. Applicability.

This CTSO affects new applications submitted after its effective date. Major design changes to flight deck (sedentary) crewmember PBE approved under this CTSO will require a new authorization. See 21.369 of CCAR-21-R4.

3. Requirements

New models of flight deck (sedentary) crewmember PBE identified and manufactured on or after the effective date of this CTSO must meet the MPS qualification and documentation requirements in SAE International's (SAE) Aerospace Standard (AS) 8031A, Personal Protective Devices for Toxic and Irritating Atmospheres Air Transport Flight Deck (Sedentary) Crewmembers, dated March 1999, as amended by appendix 1 of this CTSO.

a. **Functionality.** This CTSO's standards apply to flight deck (sedentary) crewmember PBE to be used on transport category aircraft to provide eye and respiratory protection during in-flight emergencies. This equipment is intended to be used only while the flight deck crewmember remains seated at their flight deck stations.

b. **Environmental Qualifications.** Test the equipment according to procedures in AS8026A, Crewmember Demand Oxygen Mask for Transport Category Aircraft, dated July 1996, paragraph 4.5.

c. **Deviations.** We have provisions for using alternate or equivalent means of compliance to the criteria in the MPS of this CTSO. If you invoke these provisions, you must show that your equipment maintains an equivalent level of safety. Apply for a deviation under 21.368(a) of CCAR-21-R4 before submitting your data package.

4. Marking.

a. Mark at least one major component permanently and legibly with all the information in 21.423(b) of CCAR-21R4. The marking must include the serial number, except for the following:

(1) CCAR-21-R4 21.423(b)(2). Use the name, type, and part number.

Do not use the optional model number; and

(2) CCAR-21-R4 21.423(b)(3). Use the date of manufacture. Do not use the optional serial number.

b. In addition, mark the mask assembly with the following:

(1) Size (if more than one size is manufactured)

(2) Type (as specified in CTSO-C89a, paragraph 3), and

(3) “Beards will not seal,” if applicable.

c. Also, mark the following permanently and legibly, with at least the manufacturer’s name, subassembly part number, and the CTSO number:

(1) Each component that is easily removable (without hand tools),

(2) Each interchangeable element, and

(3) Each subassembly of the article that you determined may be interchangeable.

d. Identify deviations granted to the article by marking “Deviation. See installation/instruction manual (IM)” after the CTSO number. You can abbreviate the marking to “(Dev. See IM).”

e. Optional marking is permitted to allow aircraft-specific or

operational-specific installation limitations, such as: “FOR USE ON {insert aircraft type or serial number} ONLY,” “FOR USE ON AIRCRAFT USED IN PART {insert number} OPERATIONS ONLY,” or “SEE DRAWING NO. {insert number} FOR INSTALLATION LIMITATIONS.”

5. Application Data Requirements.

The applicant must furnish the responsible certification personnel with the related data to support design and production approval. The application data include a statement of conformance as specified in section 21.353(a)(1) in CCAR-21R4 and one copy each of the following technical data:

a. Operating instructions and equipment limitations in an IM, sufficient to describe the equipment’ s operational capability. Describe any deviations in detail.

b. Installation procedures and limitations in an IM, sufficient to ensure that the flight deck (sedentary) crewmember PBE, when installed according to the installation procedures, still meets this CTSO ’ s requirements. Limitations must identify any unique aspects of the installation. Finally, the limitations must include a note with the following statement:

This article meets the minimum performance and quality control

standards required by a China technical standard order (CTSO).

Installation of this article requires separate approval.

- c. Schematic drawings of the installation procedures.
- d. Wiring diagrams of the installation procedures.
- e. List of components, by part number, that make up the flight deck (sedentary) crewmember PBE complying with the standards prescribed under this CTSO. Include vendor part number cross-references, when applicable.
- f. A component maintenance manual (CMM), covering periodic maintenance, calibration, and repair, for the continued airworthiness of installed flight deck (sedentary) crewmember PBE. Instructions should include recommended cleaning and sterilization procedures, inspection intervals, and service life. Describe the details of deviations granted, as noted in paragraph 5.aof this CTSO.
- g. Material and process specifications list.
- h. The quality control system (QCS) description required by CCAR-21-R4 21.137 and 21.358, including functional test specifications. The QCS should ensure that you will detect any change to the equipment that could adversely affect compliance with the CTSO MPS, and reject the item accordingly.
- i. Manufacturer's CTSO qualification test report.
- j. Nameplate drawing with the information required by paragraph 4

of this CTSO.

k. List of all drawings and processes (including revision level) that define the article's design. For a minor change, follow the directions in CCAR-21-R4 21.353. Show any revisions to the drawing list only on our request.

6. Manufacturer Data Requirements.

Besides the data given directly to the authorities, have the following technical data available for review by the authorities:

a. Functional qualification specifications for qualifying each production article to ensure compliance with this CTSO.

b. Equipment calibration procedures.

c. Corrective maintenance procedures within 12 months after CTSOA.

d. Schematic drawings.

e. Wiring diagrams.

f. Material and process specifications.

g. Results of the environmental tests conducted per paragraph 3.b of this CTSO.

7. Furnished Data Requirements.

a. If furnishing one or more articles manufactured under this CTSO to one entity (such as an operator or repair station), provide one copy or

technical data and information specified in paragraphs in 5.a through 5.f of this CTSO. Add any other data needed for the proper installation, certification, use, or for continued airworthiness, of the flight deck (sedentary) crewmember PBE.

8. Availability of Referenced Documents.

Order RTCA documents from:

Radio Technical Commission for Aeronautics, Inc.

1150 18th Street NW, Suite 910, Washington D.C. 20036

You may also order them online from the RTCA Internet website at:

www.rtca.org.

**APPENDIX 1. MPS FOR FLIGHT DECK (SEDENTARY)
CREWMEMBER PROTECTIVE BREATHING EQUIPMENT**

The applicable standard is SAE AS8031A, Personal Protective Devices for Toxic and Irritating Atmospheres Air Transport Flight Deck (Sedentary) Crewmembers, dated March 1999. We modified it as follows

<i>SAE AS8031A citation:</i>	<i>Modification:</i>
Section 1, SCOPE	Disregard.
Paragraph 7.1 a. Resistance to Flammability	Revise to read: “Construct the device, including packaging, (except small parts like knobs, triggers, fasteners, seals, and electrical parts) of materials that don’t contribute significantly to the propagation of a fire, and that comply with CCAR-25-R4 25.853(a) specifically Appendix F, Part I(a)(1)(iv) in effect on October 27, 2004.”
Paragraph 7.1j	Revise to read: “ANSI/ASSE Z87.1-2003, ‘Occupational and Educational Eye and Face Protection Devices.’”
Paragraph 7.1k	Revise to read: “ANSI/ASSE Z87.1-2003, (Table 8) ‘Optical Quality, Normal Corrective Vision.’ Clear versus yellow tint and vision distortion testing for thermal protection.”
Paragraph 8.1	Revise to read: “Cleaning and Sterilizing: Except for non reusable or disposable systems, ensure that cleaning and sterilizing the device is possible without major disassembly and adverse effects on operation and performance. The cleaning method must be either manufacturer-recommended, or according to SAE ARP 1176, <i>Oxygen System Component Cleaning and Packaging</i> . Include cleaning and sterilizing procedures in the CMM, per paragraph 5.f of this CTSO.”
Section 8, IDENTIFICATION	Disregard all except for paragraph 8h. Find

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	marking requirements in paragraph 4 of this CTSO and include paragraph 8h.
Paragraph 9.1	Use the following values: X=.05, Y=.10 and Z=.05.
Paragraph 10.1 For Flight deck Crewmembers	Revise to read: ‘Include an integral microphone in the protective device when it is necessary to allow the user to communicate (speak) through the aircraft's communication system. The microphone must meet CTSO-C139, or an CAAC-approved equivalent.’”