



# AEROSPACE STANDARD

AS1224™

REV. B

Issued	1971-09
Revised	1996-07
Reaffirmed	2021-08

## Continuous Flow Aviation Oxygen Masks (For Non-Transport Category Aircraft)

### RATIONALE

AS1224B has been reaffirmed to comply with the SAE five-year review policy.

#### 1. SCOPE:

This standard defines the minimum requirement for the design, construction and performance of continuous flow oxygen masks for crew and passengers of general aviation civil aircraft.

##### 1.1 Types:

This standard includes the following types of continuous flow oxygen masks.

- a. Open port dilution rebreathing masks.
- b. Valved or restrictive phase dilution rebreathing masks.
- c. Valved or restrictive phase dilution reservoir masks.
- d. Open port or restrictive dilution mask without rebreathing or reservoir bag.

##### 1.2 Description:

The masks shall be of an oronasal type covering the nose and mouth, utilizing a continuous supply of oxygen and consisting of the facepiece, valving, mask suspension device, rebreathing or reservoir bag (except Type "d"), supply tube, and including connector and flow indicator (when used).

##### 1.3 Definition:

The mask types are defined as follows:

- a. Open port dilution rebreathing mask - This is a type of mask incorporating a rebreather bag into which exhaled gases, high in oxygen content from the first portion of the previous exhalation, are introduced to be inspired again upon the next inspiration. Dilution of oxygen flowing into the mask is accomplished by fixed nonvariable orifices incorporated in the body of the mask or system, allowing dilution by introduction of ambient air during inspiration. Valving is not present between the mask facepiece and rebreathing bag.

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## 1.3 (Continued):

- b. Valved or restrictive phase dilution rebreathing mask - This type of mask may be either of the following:
  - (1) A mask utilizing a rebreather bag into which a constant flow of oxygen is introduced. A check valve between the mask and ambient air is provided so that the ambient air will not be admitted before the rebreather bag has been depleted. Valving is not present between the mask facepiece and the rebreather bag, or
  - (2) A mask utilizing a rebreathing bag but incorporating a restrictive sponge or other means which admits dilution air when subjected to a significant decrease in intra-mask pressure. Valving is not present between the mask facepiece and rebreather bag.
- c. Valved or restrictive phase-dilution reservoir mask - This type of mask provides the most efficient physiological use of constant-flow aircraft oxygen and may be one of the following:
  - (1) A mask utilizing a reservoir bag incorporating a check valve between the mask facepiece and reservoir bag to prevent introduction of exhaled gases into the reservoir bag and to assure 100% oxygen in the reservoir. Dilution is accomplished at the later phases of inspiration by a loaded ambient air valve which introduces ambient air following depletion of the 100% oxygen content of the reservoir bag, or
  - (2) A phase-dilution mask utilizing a reservoir bag with valve between the bag and the mask. A porous restrictive dilution port to provide inhalation of ambient air at a slower rate than oxygen from the reservoir, furthermore permitting the exhaled air to leave the mask.
- d. Open-port or restrictive-dilution mask without rebreathing or reservoir bag - This mask is defined as a mask which incorporates dilution ports or restrictive dilution such as by the use of open-cell foam construction or one or more air inlet valves. This mask is not recommended for efficient physiological use of the aircraft oxygen, commensurate with requirements for pilot safety or survival in hypoxic environments at altitude.

## 2. REFERENCES:

- AS452A            Oxygen Mask Assembly, Demand and Pressure Breathing, Crew
- AIR825A        Oxygen Equipment for Aircraft
- AIR1069        Crew Oxygen Requirements Up to a Maximum Altitude of 45,000 Feet
- ARP1109        Dynamic Testing Systems for Oxygen Breathing Equipment
- Federal Aviation Regulations Part 1, Paragraph 1.1
- NAS 1179, Feb. 1961

## 2. (Continued):

An Anthropometric Sizing Program for Oral-Nasal Oxygen Masks Based on 1967 U.S. Air Force Survey Data, AMRL Technical Report 75-51, McConville and Alexander

Anthropometry of Air Force Women, AMRL Technical Report 70-5, April 1972, C. E. Clauser, et al.

Anthropometric Sizing and Fit-Test of the MC-1 Oral-Nasal Oxygen Mask, WADC Technical Report 58-505, March 1959, Emanuel, Alexander, and Churchill

Recommended Subject Selection and Test Procedure for Quantitative Respirator Testing, J. T. McConville, E. Churchill and A. Hack, Health, Education & Welfare Contract HSM-99-75-15, Nov. 30, 1973

Anthropometry for Respirator Sizing, J. T. McConville, E. Churchill, and L. L. Lauback, Health, Education & Welfare Contract No. HSM-099-71-11, April 30, 1972

Selected Facial Measurements of Children for Oxygen Mask Design, J. W. Young, FAA, Office of Aviation Medicine, Civil Aeromedical Institute, Report AM 66-9, April 1966, Okla. City, Okla.

FAA Contract No. FAA-885, Feb. 8, 1962

Department of the Interior, Bureau of Mines, 4800 Forbes St., Pittsburgh, PA - Report Number RI-6865

23.1443 of the Federal Aviation Regulations

## 3. MATERIALS:

### 3.1 General:

Materials shall be of type, grade and quality which experience and/or tests have shown to be suitable for the purpose intended. Materials shall not be used which contaminate oxygen or are adversely affected by continuous service with oxygen. Materials shall have at least flame resistant properties as defined in the Federal Aviation Regulations Part 1, Paragraph 1.1.

3.1.1 Facepiece: The facepiece shall be free of objectionable odors. Materials in contact with the skin shall be selected to be as non-irritating, non-allergenic, soft and compliant to the facial configuration as practical.

3.1.2 Cleaning and Sterilizing: The mask shall be made of materials which will permit cleaning and sterilization without adverse effects and without disassembly. The method of cleaning and sterilizing shall be recommended by the manufacturer.

3.1.3 Elastomer Components: A tag or leaflet describing elastomeric components with service life limits and a suggested method for inspection and detection of any deterioration in these components which may adversely affect the performance of the mask shall be attached to or included in the packaged mask prior to delivery to the user.