



AEROSPACE STANDARD

AS8031™**REV. A**

Issued 1980-06
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Superseding AS8031

Personal Protective Devices for Toxic and Irritating Atmospheres Air Transport Flight Deck (Sedentary) Crewmembers

RATIONALE

AS8031A has been reaffirmed to comply with the SAE Five-Year Review policy.

A reaffirmed status is given to technical reports that have been reviewed by the technical committee and deemed to be current with no need for immediate revision. No changes have been made to this document as a result of this review.

1. SCOPE:

This SAE Aerospace Standard (AS) covers any protective system that serves the stated purpose.

1.1 Purpose:

This document establishes minimum performance requirements for emergency equipment, which provides flight deck (sedentary) crewmembers with eye and respiratory protection from toxic atmospheres during in-flight emergencies.

Definition of sedentary: "Sedentary" is herein defined as those flight deck crewmembers that remain seated at their flight deck stations throughout the emergency.

For those "nonsedentary" cabin crewmembers whose duty it is to leave their flight station during an emergency (for example, to actively locate and fight an on-board fire). AS8047 applies.

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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Documents

Standard, visit Sharing Hub

2.1.1 SAE Publications: Available from SAE, 400 commonwealth Drive, Warrendale, PA. 15096-0001.

AS8026	Crewmember Demand Oxygen Mask for Transport Category Aircraft
AIR825B	Oxygen Equipment for Aircraft
AS1194	Regulator Oxygen, Diluter Demand Automatic Pressure Breathing
AS1046	Minimum Standard for Portable Gaseous Oxygen Equipment
AS8047	Performance Standard for Cabin Crew Portable Protective Breathing Equipment for Use During Aircraft Emergencies

2.1.2 Other Publications:

TSO C58	Aircraft Microphones
TSO C78	Crewmember Demand Oxygen Mask
TSO C89	Oxygen Regulators, Demand
TSO C99	Protective Breathing Equipment
TSO C116	Crewmember Protective Breathing Equipment
FAR PART 25	
FAR PART 191	
FAA-AM-78-41	FAA Report: Optical Properties of Smoke Protective Devices

2.2 Abbreviations and Definitions:

L/min	Liters per minute
μL	microliter
NTPD	Normal temperature and pressure, dry (21 °C, 760 mmHg)
psia	Pressure in pounds per square inch, absolute
psig	Pressure in pounds per square inch, gauge
Usage rate	Amount of oxygen furnished by the system for breathing and outboard leakage from the mask and/or goggles per unit(s) of time
mmHg	Pressure in millimeters of mercury
ID	Inside diameter
	Mean contaminant concentrate
R	Ratio of contaminant concentration in protective breathing device to concentration in enclosure.
mbar	Millibar (1 mbar = 0.0145 psi) (1 mbar = 0.75 mmHg) (1 mbar = 100 Pa)
Pa	Pressure in pascals

3. PERFORMANCE:

The emergency equipment provided should assure the wearer protection against an oxygen deficient, toxic or highly irritating environment (e.g., smoke). The equipment donned under stresses of emergency shall orient to the face or head and interface to mating equipment, where required, in an obvious and uncomplicated manner. Respiratory and eye protection shall be provided in a manner that does not compromise the user's ability to perform his/her required tasks.

4. BREATHING GAS SYSTEM:

The protective system described herein requires a supply of breathing gas. This supply may be self-contained or it may be part of the aircraft oxygen system, either fixed or portable. Any system that employs existing components or interfaces with existing components must demonstrate satisfactory performance when interfaced with such system or components.

5. DURATION:

Any system qualified to the requirements of this document shall provide the user with satisfactory protection for at least 15 min at a pressure equivalent to an altitude of 2438 m (8000 ft) with a respiratory rate of 30 L/min BTPD.

For systems or components of systems that require positive pressure to furnish satisfactory protection, a positive pressure versus gas consumption curve shall be supplied with the system, along with instructions on the proper matching of the system of component to assure 15 min minimum duration.

6. COMPONENTS:

Typical, but not mandatory in all devices.

- a. Face piece, either oronasal or full-face
- b. Goggle
- c. Hood (with neck closure)

NOTE: a and b may be integrated into a single unit. c may be utilized in lieu of, or in combination with a and b.

- d. Suspension device
- e. Valve or valves and/or regulator
- f. Supply tube assemblies with disconnect
- g. Communications accessories
- h. Miscellaneous additional components as required

7. MATERIALS:

7.1 The materials to be used in the protective systems shall meet requirements of the appropriate sections of the following:

- a. Resistance to Flammability
FAR 25.853
U.L. 94 Tests for Flammability of Plastic Materials for Parts in Devices and Appliances (Self-Extinguishing). Any further testing would be on assembled devices.
- b. Resistance to Ozone Degradation
ASTM D 1149-64 "Accelerated Ozone Cracking of Vulcanized Rubber"
MIL-STD 417 "Rubber Composition. Vulcanized General Purpose. Solid"
- c. Resistance to Ultraviolet Degradation
ASTM D 750 "Operating Light- and Weather-Exposure Apparatus (Carbon-Arc Type) for Artificial Weather Testing of Rubber Compounds"

7.1 (Continued):

- d. Resistance to Wear and Tear (Abrasion)
ASTM D 228 "Abrasion Resistance of Rubber and Elastomeric Materials by the Pico Method"
- e. Resistance to Skin Reactions
OSHA Tests
- f. Oxygen Compatibility
Manufacturer's data on raw materials or on furnished products. Possibly ASTM D 572-67 "Oxygen-Pressure Test for Aging of Rubber".
- g. Odors
Sniff tests by different individuals
- h. Resistance to Deformation Due to Stowage
ASTM D 1171-67 or D 572-67 "Weather Resistance Exposure of Automotive Rubber Compounds"
- i. Resistance to Aging (other than b, d, and f above)
ASTM D 572-67 "Oxygen-Pressure Test for Aging of Rubber"
- j. Resistance to Shatter (Lens)
ANSI Z287.1-1968 "Practice for Occupational and Educational Eye and Face Protection"
- k. Optical Quality
ANSI.1 (Table 8) "Optical Quality, Normal Corrective Vision". Clear versus yellow tint and vision distortion testing for thermal protection.

8. IDENTIFICATION:

The following information shall be legibly and permanently marked on each device:

- a. AS8031
- b. Name or description of device (optional)
- c. Date of manufacture
- d. Manufacturer's part number
- e. Manufacturer's name or trademark
- f. Size (if applicable)
- g. Serial number (optional)