

**Cargo Compartment Fire Detection Instruments
(Turbine Powered Subsonic Aircraft)**

FOREWORD

This document has been declared "NONCURRENT". It is recommended, therefore, that this document not be specified for new designs. "NONCURRENT" refers to those documents which have previously been widely referenced and may continue to be required on some existing designs. "NONCURRENT" documents are available from SAE upon request.

1. PURPOSE:

This Aerospace Standard establishes the essential minimum safe performance standards for cargo compartment fire detector instruments primarily for use with turbine powered subsonic transport aircraft, the operation of which may subject the instruments to the environmental conditions specified in Section 3.3.

2. SCOPE:

This Aerospace Standard covers three basic types of cargo compartment fire detector instruments.

2.1 Basic Types - Definition of:

- | | |
|----------|--|
| Type I | Carbon Monoxide, an instrument which will actuate an alarm signal when the concentration of carbon monoxide in air exceeds a specified value. |
| Type II | Smoke Detector, Electronic, an instrument operating on the principle of smoke particles modifying the relationship between a light beam and electronic light sensor which will actuate an alarm signal when the concentration of smoke in air exceeds a specified value. |
| Type III | Smoke Detector, Visual, an instrument which by visual means will show in a positive manner the presence of smoke when the concentration of smoke in air exceeds a specified value. |

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3. GENERAL REQUIREMENTS:

3.1 Materials and Workmanship:

- 3.1.1 Materials: Materials shall be of a quality which experience and/or tests have demonstrated to be suitable and dependable for use in aircraft instruments.
- 3.1.2 Workmanship: Workmanship shall be consistent with high-grade aircraft instrument manufacturing practice.

3.2 Identification:

The following information shall be legibly and permanently marked on the instrument or attached thereto:

- a. Name of Instrument
- b. SAE AS446
- c. Manufacturer's Part Number
- d. Manufacturer's Serial Number or Date of Manufacture
- e. Manufacturer's Name and/or Trade-Mark
- f. Rating (Electrical, Vacuum, Etc.)
- g. Type Number
- h. Alarm Setting

3.3 Environmental Conditions:

The following conditions have been established as minimum design requirements. Tests shall be conducted as specified in Sections 5, 6 and 7.

- 3.3.1 Temperature: When installed in accordance with the instrument manufacturer's instructions, the instrument shall function over the range of ambient temperatures shown in Column A below and shall not be adversely affected by exposure to the range of temperatures shown in Column B below.

<u>Instrument Location</u>	<u>A</u>	<u>B</u>
Pressurized Areas	-30 to 50C	-65 to 70C
Non-pressurized or External Areas	-55 to 70C	-65 to 70C

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- 3.3.2 Altitude: When installed in accordance with the instrument manufacturer's instructions, the instruments shall function from sea level up to the altitudes and temperatures listed below: Altitude pressure values are per NACA Report 1235: The instrument shall not be adversely affected following exposure to extremes in ambient pressure of 50 and 3 inches of mercury absolute respectively.

<u>Instrument Location</u>	<u>Altitude</u>	<u>Temp.</u>
Pressurized Areas	15,000 ft.	50C
Non-pressurized or External Areas	60,000 ft.	20C

- 3.3.3 Vibration: When installed in accordance with the instrument manufacturer's instructions, the instruments shall function and shall not be adversely affected when subjected to vibrations of the following characteristics:

<u>Instrument Location</u>	<u>Frequency Cycles Per Sec.</u>	<u>Max. Double Amplitude - Inches</u>	<u>Maximum Accel.</u>
Fuselage			
Forward of Spar Area	5 - 500	0.036	2g
Center of Spar Area	5 - 1000	0.036	4g
Aft of Spar Area	5 - 500	0.036	7g
	500 - 1000	-	5g
Vibration Isolated Rack	5 - 1000	0.030	1g
Instrument Panel	5 - 30	0.020	-
	30 - 1000	-	0.25g

- 3.3.4 Humidity: The instrument shall function and shall not be adversely affected following exposure to any relative humidity in the range from 0 to 95 per cent at a temperature of approximately 70C.

3.4 Fire Hazard:

The instrument shall be so designed to safeguard against hazards to the aircraft in the event of malfunction or failure, and the maximum operating temperature of surfaces of any instrument component contacted by combustible fuel or vapor shall not exceed 200C due to self-heating.

3.5 Radio Interference:

The instruments shall not be the source of objectionable interference, under operating conditions at any frequencies used on aircraft either by radiation or feed-back, in electronic equipment installed in the same aircraft as the instrument.