

AEROSPACE STANDARD

AS6923™

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Portable Measuring Devices/Systems for Maintenance Troubleshooting of Aircraft Cabin and Flight Deck Air Quality Issues

RATIONALE

This standard has been requested by industry to guide the development of portable measuring devices/systems (“devices”) for use in the aircraft cabin and flight deck air for maintenance purposes. There is a need for devices to assist maintenance technicians in identifying the source of airborne compounds that may be present in the cabin/flight deck air to facilitate more productive maintenance actions and effective mitigation strategies.

TABLE OF CONTENTS

1.	SCOPE	2
1.1	Purpose	2
2.	REFERENCES	2
2.1	Applicable Documents	2
2.1.1	SAE Publications	2
2.1.2	FAA Publications	2
2.1.3	ISO Publications	2
2.1.4	RTCA Publications	2
2.1.5	U.S. Government Publications	3
2.1.6	IEC Publications	3
2.1.7	Other Publications	3
2.2	Definitions	3
2.3	Abbreviations	4
3.	DEVICE REQUIREMENTS	4
3.1	General Requirements	4
3.2	Technical Requirements	5
3.2.1	Instrument Response to Sources	5
3.2.2	Device Maintenance and Service Life	5
3.2.3	Calibration Requirements	6
3.2.4	Environmental Requirements	6
3.2.5	Data Storage and Download	7
3.2.6	Indication Requirements	7
3.2.7	Operational Use Requirements	8
4.	NOTES	8
4.1	Revision Indicator	8

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1. SCOPE

- This standard defines minimum performance requirements for a device that contains one or more sensors that identify, distinguish between, and measure either quantitatively or qualitatively gaseous compounds and/or airborne particulates associated with one or more sources intended to provide information to guide maintenance actions.
- The minimum performance requirements are for a portable unit to be used inflight, on the ground, or both, for maintenance troubleshooting purposes.
- This standard does not address interface installation of the sensor unit with the aircraft.
- The data collected by these sensors is not intended to assess impacts on aircraft occupant health and should not be used to make a finding of airworthiness.
- Fixed - installation sensor options will be addressed in a separate document.

1.1 Purpose

The purpose of this standard is to aid manufacturers in creating devices that will provide maintenance staff with objective, reliable data consistent with certain types of airborne contaminants ("sources"), captured either during an event or during maintenance troubleshooting on the ground, in both cases for post-flight interpretation on the ground.

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 specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AIR6945 Supplemental Information for Design of Measuring Devices for Measurement of Aircraft Cabin Air Quality

2.1.2 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

2.1.2.1 FAA Advisory Circulars

AC 20-184 Guidance on testing and installation of rechargeable lithium battery and battery systems on aircraft

2.1.3 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ISO 13732-1 Ergonomics of the thermal environment

2.1.4 RTCA Publications

Available from RTCA, Inc., 1150 18th Street, NW, Suite 910, Washington, DC 20036, Tel: 202-833-9339, www.rtca.org.

DO-160 Environmental conditions and test procedures for airborne equipment

2.1.5 U.S. Government Publications

Available from The U.S. Department of Health and Human Services, 200 Independence Avenue, SW, Washington, DC 20201, Tel: 1-877-696-6775, www.hhs.gov.

MIL-STD-810 Environmental engineering considerations and laboratory tests

2.1.6 IEC Publications

Available from IEC Central Office, 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, Tel: +41 22 919 02 11, www.iec.ch.

IEC Standard 60529 "Degrees of Protection Provided by Enclosures (IP Code)," International Electrotechnical Commission, Geneva, Switzerland.

2.1.7 Other Publications

AIHA "Reporting specifications for electronic real time gas and vapor detection equipment fact sheet," American Industrial Hygiene Association Real Time Detection Systems Committee. Available at: <https://aiha-assets.sfo2.digitaloceanspaces.com/AIHA/resources/Reporting-Specifications-for-Real-Time-Detection-Fact-Sheet.pdf>, 17 Oct. 2016.

ASD-STE 100 "International specification for the preparation of technical documentation in a controlled language," Aerospace and Defence Industries Association of Europe (ASD), Brussels, Belgium.

D1356-17. Standard terminology related to sampling and analysis of atmospheres Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

2.2 Definitions

ACCURACY: The degree of conformity of a value generated by a specific procedure to the assumed or accepted true value and includes both precision and bias (ASTM D1356).

CABIN: Passenger and cabin crew seating areas, crew rest area, galleys, flight deck, and lavatories.

CALIBRATION: The adjustment of the sensors' response to match the desired value compared to a known concentration of test compound, in accordance with the manufacturer's instructions.

CALIBRATION INTERVAL: The frequency of calibration of the instrument to provide assurance of measurement accuracy.

CROSS-SENSITIVITY: The known additive or subtractive effect of gases or vapors on the instrument reading, often presented as the anticipated change in the reading of a calibration standard (AIHA, 2016).

DEVICE: A piece of equipment that contains one or more sensors to assist in determining the source of contamination.

INTERFERENCE: The effect by any chemical or physical interaction with the instrument sensor that reduces the instrument's accuracy or precision (AIHA, 2016).

PRECISION: The degree of agreement of repeated measurements of the same property, expressed in terms of dispersion of test results about the mean result obtained by repetitive testing of a homogenous sample under specified conditions. The precision of a method is expressed quantitatively as the standard deviation computed from the results of a series of controlled determinations (ASTM D1356).

PORTABLE: A device which is small and lightweight enough to be handled by one person and which does not require an interface with the aircraft for its operation.

RESPONSE CHECK: A check to ensure that the sensor is working correctly.