



# AEROSPACE INFORMATION REPORT

AIR1609™

REV. B

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Superseding AIR1609A

(R) Aircraft Humidification

## RATIONALE

The purpose of the revision is to update the AIR per the latest technology references, instrumentations, and other related subjects

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## 1. SCOPE

This SAE Aerospace Information Report (AIR) covers the design parameters for various methods of humidification applicable to aircraft, the physiological aspects of low humidities, the possible benefits of controlling cabin humidity, the penalties associated with humidification, and the problems which must be solved for practical aircraft humidification systems. The design information is applicable to commercial and military aircraft. The physiological aspects cover all aircraft environmental control applications.

### 1.1 Purpose

The purpose of this AIR is to provide guidelines for the design of aircraft humidification and supporting systems. Physiological effects of humidity levels on crew and passengers are reviewed, as well as effects on cabin system designs. Various techniques used for cabin humidification are discussed and evaluated. Various technical issues are addressed, and effects associated with humidification systems are described.

## 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.

#### 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](http://www.sae.org).

- AIR1168/3 SAE Aerospace Applied Thermodynamics Manual Aerothermodynamic Systems Engineering and Design
- AIR1204 Control of Water Carryover from the Environmental Control System and Condensation on the Structure
- ARP987 The Control of Excess Humidity in Avionics Cooling

#### 2.1.2 Government Publications

Copies of this document are available online at <https://ntrl.ntis.gov/NTRL>.

Food and Drug Administration Public Health Service Publication No. 308, Handbook on Sanitation of Airlines, PB216691.

#### 2.1.3 Other Publications

Anderson, L. B., Lundquist, G. R., Jensen, P. L., and Proctor, D. F., "Human Response to 78 Hour Exposure to Dry Air," Arch. Environmental Health, Vol. 29, Dec. 1974.

ASHRAE Handbook, Fundamentals Volume, 2018.

Carrier, W. H., "Rational Psychrometric Formulae," Transactions ASME, 1911.

Dunklin, E. W. and Puck, T. T., "The Lethal Effect of Relative Humidity on Airborne Bacteria," Journal of Experimental Medicine 87:87, Feb. 1948.

McIntyre, D. A., "Indoor Climate," Applied Science, 1980.