



# AEROSPACE INFORMATION REPORT

AIR825™/4

REV. A

Issued 2002-01  
Revised 2002-08  
Reaffirmed 2026-06

Superseding AIR825/4

## Chemical Oxygen Systems

### RATIONALE

AIR825/4A 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.

### FOREWORD

This document is one of a set of related documents. These documents comprehensively address the "Introduction to Oxygen Equipment for Aircraft", and are referred to as slash (/) documents, rather than chapters. The documents may be obtained as a set or individually. As the field of oxygen systems for aircraft has evolved, it became cumbersome for one document to cover the full range of subject matter. The reader who is seeking overall familiarity with oxygen systems for aircraft should read all of these documents that combine to form a general reference to oxygen systems. The reader who is familiar with oxygen systems for aircraft may want to obtain only the slash documents that pertain to topics that are of specific interest.

The document set is written as an introductory level, suitable for anyone who would like to understand the basics of oxygen systems in aircraft, and specifically for the engineer who has just recently been assigned to aircraft oxygen systems. Many of these documents point the reader toward more detailed treatments located in other SAE documents.

### TABLE OF CONTENTS

|                                                    |   |
|----------------------------------------------------|---|
| 1. SCOPE .....                                     | 3 |
| 2. REFERENCES .....                                | 3 |
| 2.1 Applicable Documents .....                     | 3 |
| 2.2 Definitions .....                              | 3 |
| 3. PRINCIPLE OF OPERATION .....                    | 4 |
| 4. CHARACTERISTICS OF CHEMICAL OXYGEN SYSTEMS..... | 5 |
| 4.1 Hardware Configuration .....                   | 5 |
| 4.2 Maintenance .....                              | 6 |
| 4.3 Oxygen Flow Rates .....                        | 6 |

SAE Executive Standards Committee Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2026 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, or used for text and data mining, AI training, or similar technologies, without the prior written permission of SAE.

**TO PLACE A DOCUMENT ORDER:** Tel: 1-877-606-7323 (U.S. and Canada only)  
Tel: 1-724-776-4970 (outside U.S. and Canada)  
Fax: 724-776-0790  
Email: CustomerService@sae.org  
http://www.sae.org

SAE WEB ADDRESS:

Full document details: SAE AIR825\_4A

For more information on this standard, visit  
<https://www.sae.org/standards/content/AIR825/4A/>

Documents

Standard, visit Sharing Hub

TABLE OF CONTENTS (Continued)

4.4 Heat Evolution.....6

4.5 Purity.....6

4.6 Reliability.....7

5. CONSIDERATIONS IN SPECIFYING SYSTEMS .....7

6. PORTABLE OXYGEN SUPPLIES .....8

7. NOTES.....8

7.1 Key Words .....8

## 1. SCOPE:

This SAE Aerospace Information Report (AIR) provides an orientation regarding the general technology of chemical oxygen generators to aircraft engineers for assistance in determining whether chemical oxygen generators are an appropriate oxygen supply source for hypoxia protection in a given application and as an aid in specifying such generators. Information regarding the details of design and manufacture of chemical oxygen generators is generally beyond the scope of this document.

## 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, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

|           |                                                          |
|-----------|----------------------------------------------------------|
| AIR825/8  | Continuous Flow Oxygen Systems                           |
| AIR825/11 | Closed Cycle Breathing Apparatus                         |
| AIR1133   | Chemical Oxygen General Information                      |
| AS1303    | Portable Chemical Oxygen                                 |
| AS1304    | Continuous Flow Chemical Oxygen Generators               |
| ARP1894   | Useful Life Determination for Chemical Oxygen Generators |
| AS8010    | Aviators Breathing Oxygen Purity Standard                |

### 2.2 Definitions:

**CHEMICAL CORE:** An object, composed of sodium chlorate or an analogous alkali metal chlorate or perchlorate, formulated with fuels, catalysts, and other modifiers and additives as required by the particular design, which evolves oxygen by a controlled chemical decomposition reaction, when actuated. Also sometimes called a chlorate candle.

**CHEMICAL OXYGEN GENERATOR:** A device comprising a chemical core and its surrounding mechanical enclosure, insulating material, actuation means for the chemical core, and any necessary filtering means. A means of conveying evolved oxygen to the masks is also frequently included, although that function can also be fulfilled by an external manifold.

**CHLORATE CANDLE:** An alternate term sometimes applied to a chemical core, possibly because the progress of the organized decomposition reaction along the length of the core can be likened to the burning of a candle. This term is also sometimes loosely applied to the entire chemical oxygen generator.