



AEROSPACE INFORMATION REPORT

AIR825™/6

REV. A

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Superseding AS825/6

(R) On-Board Oxygen Generating Systems (Molecular Sieve)

RATIONALE

The revision of this SAE Aerospace Information Report, which is intended to provide comprehensive reference and background information pertaining to molecular sieve on-board oxygen generating systems as part of an overall document set to address oxygen equipment for aircraft, some of the background and safety and reliability and physical effects will be reviewed and adapted to the latest knowledge and applications.

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 at an introductory level, suitable for anyone who would like to understand the basics of oxygen systems on 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.

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1. SCOPE

The information provided in AIR825/6 applies to On Board Oxygen Generating Systems (OBOGS) - Molecular Sieve, that utilize the ability of molecular sieve materials by using Pressure Swing Adsorption Process (PSA) to separate and concentrate oxygen in the product gas from the surrounding air, respectively air provided by any compressor or by the aircraft engine (so called: Bleed Air), and to provide this oxygen enriched air or product gas as supplemental oxygen for breathing gas supply of crew and passengers onboard aircraft. The distribution system and the provided oxygen concentration have to fulfill the respective airworthiness regulations.

Equipment using this technology is to provide supplemental oxygen for breathing gas supply of crew and passengers onboard aircraft, the suitable breathing gas oxygen partial pressure or oxygen concentration requirements are specified in AIR825/2 and the oxygen purity requirements in AS8010.

NOTE: OBOGS has never been certified for commercial aircraft. The 14 CFR/CS 25 as well as 14 CFR 121/Commission Regulation (EU) N° 965/2012, amended need to be reviewed and if necessary amended prior to introduction of OBOGS. Alternatively, such certification will likely incorporate various special conditions that address differences in performance between OBOGS and conventional systems.

These systems are intended for:

- a. The on-line breathing gas supply to directly account for the normal oxygen usage of crew and passengers in terms of:
 1. Supplemental oxygen for part or all of an emergency descent
 2. Supplemental oxygen for first aid
 3. Therapeutic oxygen
- b. The replenishment of the aircraft gaseous oxygen system storage cylinders to account for the normal oxygen usage of crew and passengers and system leakage
- c. A combination of the above.

The possible applicability and benefit of incorporation of OBOGS-Molecular Sieve into non-military aircraft is being considered by the representatives of Civil Aviation. The intended aim of AIR825/6 is to provide a fundamental description of the function of existing OBOGS-Molecular-Sieve systems with a related reference to the type of oxygen standards which would merit a review.

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

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AIR825 Oxygen Equipment for Aircraft

ARP4754A Guidelines for Development of Civil Aircraft and Systems