



AEROSPACE RECOMMENDED PRACTICE

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Useful Life Determination for Chemical Oxygen Generators

RATIONALE

The sponsoring Committee believes the technical content of this document is stable in nature and there are unlikely to be technology developments that would alter or reduce the utility of the present technical content.

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1. SCOPE:

The scope of this document is to provide a guideline for the preparation of a plan for testing of in-service chemical oxygen generators to confirm their design useful life. The test program should also allow determination with a sufficient level of confidence, whether generators are suitable for further use (i.e., life extension, or if the useful life limit has been reached).

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.

AS1303	Portable Chemical Oxygen
AS1304	Continuous Flow Chemical Oxygen Generators
ARP1320	Determination of Chlorine in Oxygen from Solid Chemical Oxygen Generators
AS8010	Aviator's Breathing Oxygen (ABO) Purity Standard

2.1.2 FAR Publications: Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591.

FAR PART 23	Airworthiness Standards, Normal, Utility, Acrobatic and Commuter
FAR PART 25	Airworthiness Standards, Transport Category Aircraft

- 2.1.3 U.S. Government Publications: Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

49 CFR 172.102 (c)(i) Special Provision 60

49 CFR Chapter 1, Subchapter C - Hazardous Material Regulations

- 2.1.4 ATA Publications: Available from Air Transport Association of America, 1301 Pennsylvania Avenue, NW, Washington, DC 20004-1707.

ATA 300 Packaging of Airline Supplies

- 2.1.5 Airframe Manufacturer's Documents, or Supplier's Document, as applicable:

Item Specification Control Document

Quality Assurance Acceptance Test Procedures

Qualification Test Procedures

2.2 Definitions:

- 2.2.1 USEFUL LIFE: The useful life of a generator is defined as the sum of the shelf life and the service life from the time of manufacture.

- 2.2.2 FAMILY: A group of chemical oxygen generators having different part numbers, whose designs are sufficiently similar that factors affecting the useful life of one member of the group would reasonably be expected to affect all members in an analogous manner.

3. TECHNICAL REQUIREMENTS:

3.1 General Requirements:

- 3.1.1 Program: A test program shall be prepared using an appropriate methodology which evaluates the current performance of the generator against its original lot acceptance test data to determine any changes in performance that would constitute a trend that might affect the intended purpose.

- 3.1.2 Test Units: Specific part numbers shall be included in the test program (test articles). The test units shall be supplied by aircraft operators from in-service airplanes. If possible, generators should be identified as to what type of aircraft and where generator was installed.

Test articles should be packaged for shipment in a manner which adequately protects them from shipping damage and complies with relevant regulations.

- 3.1.3 Representative Sampling: The number of units in the test sample should be no less than the original lot acceptance test quantities for all types of a typical lot size. The program should also include testing of generators of a representative sampling of a given year's production of a particular part number, to provide a level of confidence sufficient to permit the units to be used for an additional specified time period.

4. TEST PLAN:

4.1 Pre-Test Inspection:

- 4.1.1 Visual: Each generator shall be initially inspected for visual evidence of corrosion, damage, degradation, contamination and evidence of improper handling.
- 4.1.2 Radiographic: The internal condition of each generator shall be examined and recorded radiographically. It shall be done in at least 2 planes, 90° apart. Penetrations shall be done accordingly to best depict internal conditions.
- 4.1.3 Electrical: If applicable, electrical and continuity checks shall be performed on each generator. Caution shall be exercised to not exceed the trigger current of the generator.

4.2 Test Requirements:

The units submitted for testing shall be tested in accordance with the following program. Refer to the appropriate Acceptance Test Procedure for the actual values and methodology.

- 4.2.1 Flow Performance Tests: One half of the sample size shall be divided as listed following and tested for (but not limited to):
- Generator ignition and flow start
 - Flow rate and duration (profile)
 - Outlet manifold surface temperature (if applicable)
 - Housing temperature(s) (if applicable)
 - Weight change
 - Release pin pull force (as applicable)