



National Institute for Occupational Safety and Health
National Personal Protective Technology Laboratory
P.O. Box 18070
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Procedure No. RCT-ASR-STP-0115

Revision: 1.1

Date: 21 September 2005

DETERMINATION OF RATED SERVICE TIME, CONSTANT FLOW, ESCAPE,
OPEN-CIRCUIT, SELF-CONTAINED BREATHING APPARATUS
STANDARD TESTING PROCEDURE (STP)

1. PURPOSE

This test establishes the procedures for ensuring that the level of protection provided by the rated service time requirements on Constant Flow, Open-Circuit, Self-Contained Breathing Apparatus (SCBA) submitted for Approval, Extension of Approval, or examined during Certified Product Audits, meet the minimum certification standards set forth in 42 CFR, Part 84, Subpart G, Section 84.63(a)(c)(d); Volume 60, Number 110, June 8, 1995.

2. GENERAL

This STP describes the Determination of Rated Service Time, Constant Flow, Open-Circuit, Self-Contained Breathing Apparatus test in sufficient detail that a person knowledgeable in the appropriate technical field can select equipment with the necessary resolution, conduct the test, and determine whether or not the product passes the test.

3. EQUIPMENT/MATERIALS

3.1. The list of necessary test equipment and materials follows:



3.1.1. Electric Timer, calibrated to hundredths of a minute (Precision Scientific Company) or equivalent.

Approvals:	1 st Level	2 nd Level	3 rd Level
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3.1.2. Dry gas meter (singer) 28.32 liters per rev or equivalent.

4. TESTING REQUIREMENTS AND CONDITIONS

- 4.1. Prior to beginning any testing, all measuring equipment to be used must have been calibrated in accordance with the manufacturer's calibration procedure and schedule. At a minimum, all measuring equipment utilized for this testing must have been calibrated within the preceding 12 months using a method traceable to the National Institute of Standards and Technology (NIST).
- 4.2. The compressed gas cylinder must meet all applicable Department of Transportation requirements for cylinder approval as well as for retesting/requalification.
- 4.3. Normal laboratory safety practices must be observed. This includes safety precautions described in the current ALOSH Facility Laboratory Safety Manual.
 - 4.3.1. Safety glasses, lab coats, and hard-toe shoes must be worn at all times.
 - 4.3.2. Work benches must be maintained free of clutter and non-essential test equipment.
 - 4.3.3. When handling any glass laboratory equipment, lab technicians and personnel must wear special gloves which protect against lacerations or punctures.

5. PROCEDURE

Note: Reference Section 3 for equipment, model numbers and manufacturers. For calibration purposes use those described in the manufacturer's operation and maintenance manuals.

- 5.1. When testing escape self contained breathing apparatus with a constant flow, the flow from the unit is monitored with a dry test meter for the duration requested by the manufacturer. The flow rate must fall within the parameters called for in the manufacturer's Q.C. plan.

5.2. Data Analysis

For constant flow, compare values to the manufacturer's Q.C. plan.

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Note: This test should be done on a minimum of two respirators, or more if additional testing is required (42 CFR, Part 84, Sections 84.12, 84.30, and 84.60).

6. PASS \FAIL CRITERIA

6.1. The criterion for passing this test is set forth in 42 CFR, Part 84, Subpart G, Section 84.63(a)(c)(d), and Subpart H, Section 84.95, Volume 60, Number 110, June 8, 1995.

6.2. This test establishes the standard procedure for ensuring that:

84.63 Test requirements; general.

(a) Each respirator and respirator component shall when tested by the applicant and by the Institute, meet the applicable requirements set forth in subparts H through L of this part.

(c) In addition to the minimum requirements set forth in subparts H through L of this part, the Institute reserves the right to require, as a further condition of approval, any additional requirements deemed necessary to establish the quality, effectiveness, and safety of any respirator used as protection against hazardous atmospheres.

(d) Where it is determined after receipt of an application that additional requirements will be required for approval, the Institute will notify the applicant in writing of these additional requirements, and necessary examinations, inspections, or tests, stating generally the reasons for such requirements, examinations, inspections, or tests.

6.3. A constant flow unit must supply air for the rated service time at a flow rate equal to or greater than the manufacturer's specification's.

7. RECORDS\TEST SHEETS

7.1. All test data will be recorded on the RATED SERVICE TIME, SPECIAL TEST - CONSTANT FLOW, OPEN-CIRCUIT, SELF-CONTAINED BREATHING APPARATUS test data sheet.

7.2. All videotapes and photographs of the actual test being performed, or of the tested equipment shall be maintained in the task file as part of the permanent record.

7.3. All equipment failing any portion of this test will be handled as follows;

7.3.1. If the failure occurs on a new certification application, or extension of approval application, send a test report to the RCT Leader and prepare the hardware for return to the manufacturer.

7.3.2. If the failure occurs on hardware examined under an Off-the-Shelf Audit the hardware will be examined by a technician and the RCT Leader for cause. All equipment failing any portion of this test may be sent to the manufacturer for examination and then returned to NIOSH. However, the hardware tested shall be

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held at the testing laboratory until authorized for release by the RCT Leader, or his designee, following the standard operating procedures outlined in Procedure for Scheduling, and Processing Post-Certification Product Audits, RB-SOP-0005-00.

**SPECIAL TEST - RATED SERVICE TIME, CONSTANT FLOW, OPEN-CIRCUIT,
SELF-CONTAINED BREATHING APPARATUS**

Project No : _____ Date: _____

Company : _____

Respirator Type: _____

Reference: 42 CFR, Part 84, Subpart G, Section 84.63(a)(c)(d).

Requirement: The unit must supply air for the rated service time at a flow rate equal to or greater than the manufacturer's specification's. The specifications for this unit call for a flow of

Procedure: The hood is placed in an airtight tank with the tank outlet connected to a dry test meter. The cylinder is turned on and the output monitored for the rated service time.

Results:

<u>Unit</u>	<u>Time/Min</u>	<u>Starting pressure</u>	<u>Lpm</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Comments:

Test Engineer: _____ Pass _____ Fail _____





Revision History

Revision	Date	Reason for Revision
1.0	23 May 2001	Historic document
1.1	21 September 2005	Update header and format to reflect lab move from Morgantown, WV No changes to method