



National Institute for Occupational Safety and Health
 National Personal Protective Technology Laboratory
 P.O. Box 18070
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Procedure No. RCT-APR-STP-0060	Revision: 1.1	Date: 24 August 2005
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DETERMINATION OF END-OF-SERVICE-LIFE INDICATOR (ESLI) DROP TEST,
 AIR-PURIFYING RESPIRATORS
 STANDARD TESTING PROCEDURE (STP)

1. PURPOSE

- 1.1. This test establishes the procedure for ensuring that the level of protection provided by the end of service life indicator drop test respirators with permanent and replaceable ESLI for air-purifying respirators submitted for Approval, Extension of Approval, or examined during Certified Product Audits, meet the minimum certification standards set forth in 42 CFR, Subpart G, Section 84.63(a)(c)(d); Volume 60, Number 110, June 8, 1995.
- 1.2. Regulatory Citation: Federal Register, Vol. 49, No. 140, Thursday, July 19, 1994. Notices, pg. 29271. Criteria for Certification of ESLI; All ESLI criteria: "4. Any ESLI that is permanently installed in the respirator facepiece shall withstand cleaning and a drop from a 6-foot height. Replaceable ESLI must be able to be easily removed and to withstand a drop from a 6-foot height." Note: If the ESLI is attached to the cartridge it is considered replaceable if the cartridge is replaceable.

2. GENERAL

This STP describes the Determination of ESLI Drop Test, Air-Purifying Respirators 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/MATERIAL

- 3.1. The list of necessary test equipment and materials follows:
 - 3.1.1. Tape measure.
 - 3.1.2. Concrete floor.

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

Approvals:	1 st Level	2 nd Level	3 rd Level
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within the preceding 12 months using a method traceable to the National Institute of Standards and Technology (NIST).

4.2. Normal laboratory safety practices must be observed. This includes safety precautions described in the current ALOSH Facility Laboratory Safety Manual.

4.2.1. Safety glasses, lab coats, and hard-toe shoes must be worn at all times.

4.2.2. Work benches must be maintained free of clutter and non-essential test equipment.

4.2.3. 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. The drop test will be conducted on two units. A unit is the assembly that retains the ESLI, (ie: the cartridge if the indicator is mounted on the cartridge, or the facepiece, if the indicator is mounted on the facepiece). Each unit is dropped once on the face of the indicator and then once on the edge of the indicator from a height of 6 feet onto a concrete surface.

6. PASS/FAIL CRITERIA

6.1. The criterion for passing this test is set forth in 42 CFR, Subpart G, Section 84.63(a)(c)(d); 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.

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- 6.3. Any ESLI that is permanently installed in the respirator facepiece shall withstand cleaning and a drop from a 6-foot height. Replaceable ESLI must be able to be easily removed and to withstand a drop from a 6-foot height.” Note: if the ESLI is attached to the cartridge it is considered replaceable if the cartridge is replaceable.
- 6.4. The ESLI shall not tear, rupture, break, crumple, or otherwise be rendered ineffective in indicating the depletion of chemical sorbent or be damaged so that its visibility to the wearer is impaired. The result of the test is evaluated as pass or fail.

7. RECORDS/TEST SHEETS

- 7.1. All test data will be recorded on the END-OF-SERVICE-LIFE INDICATOR DROP 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 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.

Task Number: _____ **Reference No.:** 42 CFR 84.63 (a)(c)(d)
Test : ESLI Drop Test **STP No.:** 60
Manufacturer: _____
Item Tested: _____

Comments:

- Requirements:**
1. Any ESLI that is permanently installed in the respirator facepiece shall withstand cleaning and a drop from a 6-foot height onto a concrete floor with a vinyl floor covering. Replaceable ESLI must be able to be easily removed and to withstand a drop from a 6-foot height. Note: If the ESLI is attached to the cartridge, it is considered replaceable if the cartridge is replaceable.
 2. The ESLI shall not tear, rupture, break, crumble, or otherwise be rendered ineffective in indicating the depletion of chemical sorbent or be damaged so that its visibility to the wearer is impaired. The result of the test is evaluated as pass or fail.

Signature: _____

Date: _____

Engineering Technician

Revision History

Revision	Date	Reason for Revision
1.0	27 March 2002	Historic document
1.1	6 June 2005	Update header and format to reflect lab move from Morgantown, WV No changes to method