QUALITATIVE FIT TEST --
STANNIC OXYCHLORIDE IRRITANT SMOKE TEST

Introduction

This protocol describes a qualitative method for conducting a respirator face piece fit test.

The test is intended to:

- Determine each subject's ability to detect the test agent;
- Help the test subject select a comfortable respirator;
- Assess respirator fit.

If irritation or coughing is not detected and the fit remains comfortable, the respirator is considered to have an adequate face piece fit. Detection of irritation or coughing indicates an inadequate fit. If the test indicates such a failure, another respirator should be selected and the test repeated. (A variety of respirator sizes and models should be available so that each user can find a respirator that provides both comfort and a good face seal.)

Once the fit test has been passed, a minimum protection factor of 10 can be assumed.

Use of negative pressure, half-face or full-face piece respirators are limited by law to concentrations less than 10 or 100 times the PEL, respectively.

Caution

This test exposes test subjects to a test atmosphere of adequate concentration to verify their ability to detect a nominal concentration of the test agent. The usual response of the normal, healthy individual to stannic oxychloride is a harmless, involuntary cough or irritation. However, some test subjects (e.g., persons with certain respiratory ailments or dysfunctions) may suspect that induced coughing would cause discomfort or harm. Those individuals should be tested with other test atmospheres. Individuals who are unable to withstand the stress of standard testing procedures may be excluded from respirator use.

Test Procedure

A. Initial preparations:
   1. Review the entire contents of this protocol.
   2. Identify an array of respirator brands, models, and sizes to test. (Most manufacturers offer three sizes for each model.)
   3. Locate an area suitable for conducting the fit tests. (Weather permitting, the testing may be done outdoors.)
      a. Suitable in size – one large (at least 12' x 20'); the other small (as little as 6' x 6')
      b. Suitable in ventilation. Both rooms should be well ventilated but not connected to the same recirculating ventilation system. Since the smaller room will comprise the fit test chamber, this room should exhaust directly outside. A bathroom or a room with a lab hood works well.

B. Final preparation for testing:
   1. Prepare the fit test chamber (the smaller area)
      a. Hang the fit test chamber in the appropriate area.
      b. Tape instructions for test exercises and Rainbow Passage to the inside walls of at eye level.

c. Place the smoke tubes and aspirator bulb near the area entrance, for easy access.

2. Set up 3-4 work tables in the orientation area (the larger area)
   a. Place the smoke tube and respirator bulb on one table. Tape the test instructions to the top of the table.
   b. A second table can be used for orientation materials, including orientation program and data collection forms. Each subject should fill out a form before he/she reviews the orientation program. Have the subjects keep their forms with them as they go through this test procedure.
   c. The last table should contain an array of respirators. One end of this table (or a fourth table) can be used for respirator cleaning.

C. Fit testing
   1. Test subjects receive an orientation program and fill out the data form
   2. Taking the data form with them, subjects go to the irritation sensitivity test area, read the instructions, and take the tests. Their response is recorded on the data form. If they will continue with the fit test, see the attached SOP: "Qualitative Fit Test: Administering the Isoamyl Acetate Test".
   3. Moving on to the respirator selection area, the instructor should help subjects to select the most comfortable fitting respirator (see attached SOP: "Selection of a Respirator for Comfort"). A functional fit test should be conducted (attached SOPs: "Functional Fit Test: The Positive Pressure Test" and "Functional fit Test: the Negative Pressure Test"). The respirator is worn for at least 10 minutes, and unless it is uncomfortable, it is worn into the fit test chamber.
   4. The test subject is asked to step inside the fit test chamber.
   5. Irritant smoke test atmosphere is administered to the test subject. If the irritation becomes noticeable inside the face piece or if coughing occurs, the test subject -- without removing the respirator -- exits the test chamber. Upon exit from the chamber, the mask is removed and cleaned. Another respirator is chosen for testing.
   6. The procedure is repeated until the fit test is passed. Subjects should record all pertinent information on the data form.
   7. In lieu of using the test chamber, the subject may be challenged with irritant smoke by using a smoke tube and aspirator bulb. Gently squeeze the bulb and direct the smoke to the face seal with the employee wearing HEPA and acid gas cartridges. If no reaction is observed, proceed with the QLFT (attached SOP "Qualitative Fit Test: Administering the Isoamyl Acetate Test").
   8. The test subject should be informed what type respirator he/she had been assigned.
   9. Fit testing should be performed at least annually, or sooner if anything should happen that may have affected respirator fit, such as substantial weight loss or gain, dentures, facial scars, etc.