shall not be detectable by any wearer during the test.

(c) Where the respirator is equipped
with a full facepiece, hood, helmet, or
mouthpiece, the canister or cartridge
will be used in place of the filter unit,
and persons will each wear the modi-

died respiratory-inlet covering for 5
minutes in a test chamber containing
1,000 parts (by volume) of isoamyl-acet-
tate vapor per million parts of air, per-
forming the work schedule specified in
paragraph (b)(2) of this section.

§ 84.1143 Dust, fume, and mist air-puri-tyng filter tests; performance re-
quirements; general.

Dust, fume, and mist respirators will
be tested in accordance with the sched-
ule set forth in Table 13 of this subpart
to determine their effectiveness as pro-
tection against the particulate hazards
specified in Table 13.

§ 84.1144 Silica dust test for dust,
fume, and mist respirators; single-
use or reusable filters; minimum re-
quirements.

(a) Three non-powered respirators
with single-use filters will be tested for
periods of 90 minutes each at a contin-
uous airflow rate of 32 liters per
minute.

(b) The relative humidity in the test
chamber will be 20–80 percent, and the
room temperature approximately 25 °C.

(c) The test suspension in the cham-
ber will not be less than 50 nor more
than 60 milligrams of flint (99+ percent
free silica) per cubic meter of air.

(d) The flint in suspension will be
ground to pass 99+ percent through a
270-mesh sieve.

(e) The particle-size distribution of
the test suspension will have a geo-
metric mean of 0.4 to 0.6 micrometer,
and the standard geometric deviation
will not exceed 2.

(f) The total amount of unretained
test suspension in samples taken dur-
ing testing shall not exceed 1.5 milli-
grams for a non-powered air-purifying
respirator.

(g) Three non-powered respirators
with reusable filters will be tested and
shall meet the requirements specified in
paragraphs (a) through (f) of this
section; each filter shall be tested
three times: Once as received; once
after cleaning; and once after re-
cleaning. The applicant’s instructions
shall be followed for each cleaning.

§ 84.1145 Silica dust test; non-powered
single-use dust respirators; min-
imum requirements.

(a) Three respirators will be tested.

(b) As described in §84.1144, airflow
will be cycled through the respirator
by a breathing machine at the rate of
21 respirations per minute with a
minute volume of 40 liters; a breathing
machine cam with a work rate of 622
kg.-m.2/minute shall be used.

(c) Air exhaled through the res-
pirator will be 35° ±2 °C. with 94 ±3 per-
cent relative humidity. #

(d) Air inhaled through the respirator
will be sampled and analyzed for res-
pirator leakage.

(e) The total amount of unretained
test suspension, after drying, in sam-
plies taken during testing, shall not ex-
ceed 1.5 milligrams for any single test.

§ 84.1146 Lead fume test for dust,
fume, and mist respirators; min-
imum requirements.

(a) Three non-powered respirators
will be tested for a period of 312 min-
utes each at a continuous airflow rate
of 32 liters per minute.

(b) The relative humidity in the test
chamber will be 20–80 percent, and the
room temperature approximately 25 °C.

(c) The test suspension in the test
chamber will not be less than 15 nor
more than 20 milligrams of freshly gen-
erated lead-oxide fume, calculated as
lead (Pb), per cubic meter of air.

(d) The fume will be generated by im-
pinging an oxygen-gas flame on molten
lead.

(e) Samples of the test suspension
will be taken during each test period
for analysis.

(f) The total amount of unretained
test suspension in the samples taken
during testing, which is analyzed and
calculated as lead (Pb), shall not ex-
ceed 1.5 milligrams of lead for a non-
powered air-purifying respirator.

§ 84.1147 Silica mist test for dust,
fume, and mist respirators; min-
imum requirements.

(a) Three non-powered respirators
will be tested for a period of 312 min-
utes each at a continuous airflow rate
of 32 liters per minute.
§84.1148 Tests for respirators designed for respiratory protection against more than one type of dispersoid; minimum requirements.

Respirators designed as respiratory protection against more than one particulate hazard (dust, fume, or mist) shall comply with all the requirements of this part, with respect to each of the specific hazards involved.

§84.1149 Airflow resistance tests; all dust, fume, and mist respirators; minimum requirements.

(a) Resistance to airflow will be measured in the facepiece, mouthpiece, hood, or helmet of a dust, fume, or mist respirator mounted on a test fixture with air flowing at a continuous rate of 85 liters per minute, both before and after each test conducted in accordance with §§84.1144 through 84.1147.

(b) The maximum allowable resistance requirements for dust, fume, and mist respirators are as follows:

<table>
<thead>
<tr>
<th>Type of respirator</th>
<th>Initial inhalation</th>
<th>Final inhalation</th>
<th>Exhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumoconiosis- and fibrosis-producing dusts, or dusts and mists</td>
<td>12</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Dust, fume, and mist, with single-use filter</td>
<td>30</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>Dust, fume, and mist, with reusable filter</td>
<td>20</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Radon daughter</td>
<td>18</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>Asbestos dust and mist</td>
<td>18</td>
<td>25</td>
<td>15</td>
</tr>
</tbody>
</table>

* Measured after silica dust test described in §84.1144.

§84.1150 Exhalation valve leakage test; minimum requirements.

(a) Dry exhalation valves and valve seats will be subjected to a suction of 25 mm. water-column height while in a normal operating position.

(b) Leakage between the valve and valve seat shall not exceed 30 milliliters per minute.

§84.1151 DOP filter test; respirators designed as respiratory protection against dusts, fumes, and mists having an air contamination level less than 0.05 milligram per cubic meter and against radionuclides; minimum requirements.

(a) All single air-purifying respirator filter units will be tested in an atmosphere concentration of 100 micrograms of DOP per liter of air at continuous flow rates of 32 and 85 liters per minute for a period of 5 to 10 seconds.

(b) Where filters are to be used in pairs, the flow rates will be 16 and 42.5 liters per minute, respectively, through each filter.

(c) The filter will be mounted on a connector in the same manner as used on the respirator, and the total leakage for the connector and filter shall not exceed 0.03 percent of the ambient DOP concentration at either flow rate.

§84.1152 Silica dust loading test; respirators designed as protection against dusts, fumes, and mists having an air contamination level less than 0.05 milligram per cubic meter and against radionuclides; minimum requirements.

(a) Three non-powered respirators will be tested in accordance with the