

Technical Data Bulletin



#161– Fit Testing 3M Tight-Fitting Positive Pressure Respirators

This TDB supercedes TDB #140

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The purpose of this bulletin is to describe recommended ways for fit testing 3M tight-fitting positive pressure respirators.

Background

In 29 CFR 1910.134 (f) (8), OSHA states:

Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

- (i) Qualitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user’s actual facepiece into a negative pressure respirator with appropriate filters, or by using an identical negative pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or powered air-purifying respirator facepiece.
- (ii) Quantitative fit testing of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by

installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.

- (iii) Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

The purpose for fit testing the facepiece of a positive pressure respirator is to eliminate “gross” face seal leakage that might degrade protection or shorten service life for self-contained breathing apparatus (SCBA). Either qualitative or

quantitative fit testing may be used for **all** positive pressure, tight-fitting atmosphere-supplying respirators and tight-fitting powered air purifying respirators (PAPRs). While these respirators are used as positive pressure respirators in the workplace, they are fit-tested in the negative pressure mode. As a consequence, the minimum acceptable fit factor for a facepiece in the negative pressure mode is lower than the assigned protection factors (APF), which are based on use in the positive pressure mode. Positive pressure respirators that pass the qualitative fit test (QLFT) or quantitative fit test (QNFT) may be used at the APFs of these respirators. See table 1 for a summary.

Table 1: Acceptable Fit-Testing Methods for Positive Pressure Tight-Fitting Respirators

Respirator Type	QLFT	QNFT	APF*
PAPR** Half Facepiece	Yes	Yes	50
PAPR** Full Facepiece	Yes	Yes	1000
SAR*** Continuous Flow or Pressure Demand Mode			
• Half Facepiece	Yes	Yes	50
• Full Facepiece	Yes	Yes	1000
SCBA**** Full Facepiece, Positive Pressure	Yes	Yes	10,000
SCBA/SAR Full Facepiece, Positive Pressure	Yes	Yes	10,000

***APF**: Assigned Protection Factor from American National Standard Institute (ANSI) for Respiratory Protection, ANSI Z88.2-1992. Note, assigned protection factors may vary for specific standards as promulgated by OSHA (e.g., continuous flow supplied air respirators are assigned a protection factor of 100 in the OSHA Asbestos Standards, 29 CFR 1910.1001 and 29 CFR 1926.1101). Where assigned protection factors in local, state, or federal standards are lower than those listed here, they should be used instead.

****PAPR**: Powered Air Purifying Respirator

*****SAR**: Supplied Air Respirator

******SCBA**: Self-contained Breathing Apparatus

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When quantitative fit testing is used, **all** respirators with a full-facepiece must meet or exceed a fit factor of 500, while half-mask respirators must meet or exceed 100 according to the OSHA compliance directive (CPL 2.120 “Inspection Procedures for the Respiratory Protection Standard”). During qualitative fit testing a fit factor is not determined. If the qualitative fit test is passed, the fit is acceptable and the APF can be used.

Respirators Using the 6000 Series Half or Full Facepiece, 6000DIN Series Full Facepiece, 7800S Full Facepiece, or 7500 Half Facepiece

- 3M™ GVP™ Belt-Mounted PAPR
- 3M™ Powerflow™ Face-Mounted PAPR
- 3M™ Breathe Easy™ Belt-Mounted PAPR
- 3M™ Dual Airline SAR
- 3M™ Air Control Devices—
Continuous Flow SAR

These facepieces can be temporarily converted to a negative pressure respirator by attaching the appropriate cartridge or filters and holders (where required). The respirator is then fit tested in the same manner as the corresponding negative pressure air-purifying model. Each of these facepieces is also available as a negative pressure respirator that can be purchased and equipped with the appropriate filters or cartridges. They can be qualitatively or quantitatively fit tested by any of the OSHA accepted fit test protocols.

3M™ Pressure Demand Systems Using the 6000PD Series Full Facepiece

Fit Testing can be conducted by using a standard 3M 6000 Series Full Facepiece Respirator. The 6000PD and the 6000 Series Full Facepiece shells are produced from the same mold and are identical in conformation. By attaching the appropriate cartridges or filters, the 6000 Series Full Facepiece can be qualitatively or quantitatively fit tested by any of the OSHA accepted fit test protocols.

Alternatively, the 6000PD can be fit tested by temporarily converting the facepiece to the corresponding 6000 Series Full Facepiece by removing the 6874 Pressure Demand Adapter Assembly and replacing it with the 6892 Center Adapter Assembly. The respirator is then fit tested in the same manner as the 6000 Series negative pressure air-purifying model.

Respirators Using the 055-00-01R01 Full Facepiece

This facepiece can be used in both the powered air purifying respirator mode with the 3M™ Breathe Easy™ Belt-Mounted PAPR and in airline respirator mode.

Qualitative Fit Testing

If the facepiece is used in the PAPR mode, it can be converted into the negative pressure mode by simply not turning on the motor-blower assembly. The respirator can then be fit tested using any of the qualitative fit test protocols after attaching the appropriate

filters or cartridges (see the fit testing protocols in 29 CFR 1910.134 Appendix A).

An alternative method for both the airline and PAPR mode is to remove the corrugated breathing tube from the full facepiece and attach the appropriate PAPR filter or cartridge directly to the facepiece. Tighten the filter until it is snug. Do not overtighten since this may result in leaks that cannot be distinguished from face seal leaks. If isoamyl acetate is used for fit testing, use any of the PAPR organic vapor cartridges/canisters. We believe the Type A cartridge is the best choice. For saccharin, Bitrex™ or irritant smoke, use any of the P3 high efficiency filters. The SP3 high efficiency filter is recommended because it is easier to fit in the test hoods.

Quantitative Fit Testing

Only the aerosol quantitative fit test protocols can be used for this facepiece. Adapters for the controlled negative pressure technique do not exist.

Install the 3M 701 Cartridge/Filter Adapter in the center port of the full facepiece where the corrugated breathing tube normally fits and connect the 3M 601 Fit Test Probe Adapter. By using a P100 type filter, such as the 3M 2091 or 7093 particulate filter quantitative fit testing may be conducted. The probe should be placed inside the nose cup. Follow the instructions for the 601 Quantitative Fit Test Adapter.

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Air-Mate™ Self Contained Breathing Apparatus (SCBA) Using the 7800S-AM Series Full Facepiece

- 3M™ Air-Mate™ 2000 SCBA
- 3M™ Air-Mate™ SCBAG SCBA
- 3M™ Air-Mate™ Combination Escape Self-Contained Breathing Apparatus (ESCBA)/Supplied Air Respirator (SAR)

The 7800S-AM Full Facepiece **cannot** be used for fit testing. You must use a standard 7800S Full Facepiece for fit testing. The 7800S and 7800S-AM silicone facepiece shells are produced from the same facepiece mold and are identical in conformation. The 7800S can be qualitatively or quantitatively fit tested by any of the OSHA accepted fit test protocols by attaching the appropriate cartridges or filters and holders (where required).

Self Contained Breathing Apparatus (SCBA) Using the 7800S-BA Series Full Facepiece

- 3M™ 2000 SCBA
- 3M™ SCBAG SCBA
- 3M™ Combination Escape Self-Contained Breathing Apparatus (ESCBA)/Supplied Air Respirator (SAR)

Use the 7800S Full Facepiece for fit testing. Since the 7800S and the 7800S-BA silicone facepiece shells are produced from the same facepiece mold they are identical in conformation. The 7800S can be qualitatively or quantitatively fit tested by any of the OSHA accepted fit test protocols by attaching the appropriate cartridges or filters and holders (where required).

Alternatively, install a 3M 701 Cartridge/Filter Adapter into the center port of the 7800S-BA and connect the appropriate cartridge or

filter for fit testing. The 7800S-BA Facepiece can be qualitatively fit tested by any of the OSHA accepted fit test protocols. Qualitative Fit Testing with the 3M FT-10 (sweet) or FT-30 (bitter) Qualitative Fit Test Apparatus can be conducted by connecting a 95 or 100 type filter, such as the 3M 2071, 2091 or 7093 Particulate Filter. For quantitative fit testing using the aerosol quantitative fit test protocol, connect a 3M 601 Fit Test Adapter. By using a P100 type filter, such as the 3M 2091 or 7093, P100 Particulate Filter, quantitative fit testing may be conducted.

For more information, please contact:

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