

# Respirator Fit Testing



## **PORTACOUNT® Plus Respirator Fit Tester and N95-Companion™**

*Fit Test the Easy Way!*



# Fit Testing Made Easy

Respirator fit testing doesn't have to be difficult. You can make fit testing easier and increase your confidence in the test results by using the PORTACOUNT Plus Respirator Fit Tester. Any other way is the hard way!

The PORTACOUNT Plus is the easy, hassle-free way to reliably fit test a variety of respirator types. The PORTACOUNT not only eliminates the guesswork found with other testing methods, it also reduces the amount of work associated with fit testing in general. Plus, with the convenient FitPlus™ software that comes with each instrument, you can streamline the fit testing process even further by letting your computer do the work.

The PORTACOUNT makes a direct measurement of respirator fit factors. There are no error-inducing assumptions made to calculate "equivalent" fit factors. The measurement is made while the person simultaneously performs dynamic moving and/or breathing exercises designed to stress the respirator seal in ways that simulate anticipated workplace motions.



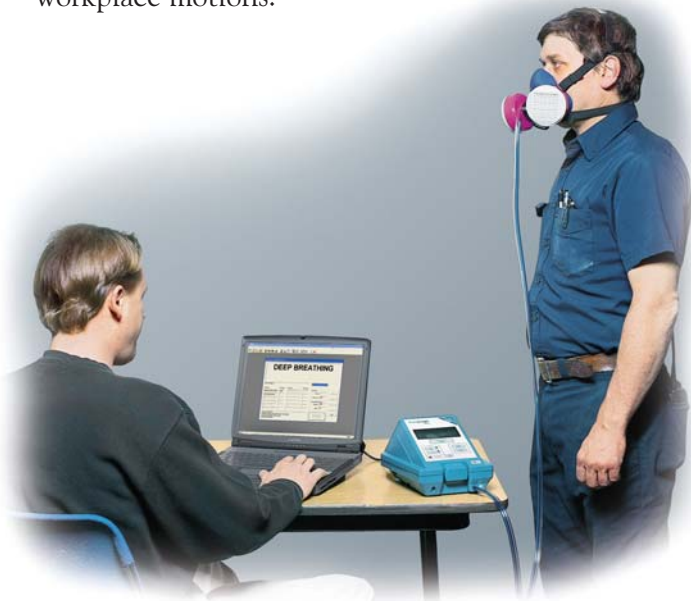
## *Eliminate the guesswork*

The PORTACOUNT eliminates the human variables associated with qualitative methods. Variations in sensitivity to the challenge chemical or lack of cooperation can't influence the test results because the employee makes no decisions. And, unlike other methods, the PORTACOUNT results are immediate and unambiguous. The PORTACOUNT Plus performs the fit test and delivers a "pass" or "fail." It's that easy.

The PORTACOUNT won't let you measure respirator fit incorrectly because the entire process is automated. Once the fit test is started, the PORTACOUNT goes through a programmed sequence. There is no opportunity to take shortcuts or skip critical steps. Compare that to qualitative methods like saccharin, Bitrex®, banana oil, and irritant smoke that involve tedious manual procedures. These procedures are often done incorrectly, thereby invalidating the fit test.

## *OSHA accepted*

The PORTACOUNT has been accepted by OSHA for compliance with all fit testing regulations since 1988. Recent standards, including the new OSHA respiratory protection standard 29CFR1910.134, specifically recognize the PORTACOUNT and provide specific protocols.



### ***Fit test any tight-fitting respirator***

The PORTACOUNT can be used to fit test almost any tight-fitting respirator including elastomeric half and full-face masks, PAPRs, SCBA, and even disposable (filtering-facepiece) respirators. Positive-pressure masks must be temporarily converted to negative-pressure mode per regulatory requirements prior to fit testing. Series-95 disposable masks require use of the N95-Companion™ accessory.

### ***Fit test in the employee's own mask***

You can fit test with conventional probed test masks or use a mask sampling adapter to test people in their own respirator. Mask sampling adapters allow you to eliminate hygienic concerns associated with sharing a test mask and also facilitate simultaneous integrity testing of the respirator itself. Mask sampling adapters are available for most popular respirators. They can be obtained through TSI or directly from your respirator manufacturer.

### ***Easy to use***

The PORTACOUNT Plus eliminates the awkward fit test hoods and chemical exposure concerns associated with other fit test methods. It uses the microscopic particles that exist in ambient air to measure the fit factor directly. The PORTACOUNT measures the concentration of these particles around the person's head and then measures the concentration of those particles that leak into the respirator. The ratio of these two numbers is the fit factor. A fit factor of 100, for example, means that the air inside the respirator is 100 times cleaner than the air outside. The PORTACOUNT measures a fit factor for each of the fit test exercises and then computes an overall fit factor for the entire test, along with a pass or fail indication.

### ***Unlimited fit testing for full-face masks***

You can use full-face masks to their full potential if you fit test them with the PORTACOUNT. This is not the case with qualitative methods because they are inherently limited to a half-mask fit factor pass level of only 100, thereby limiting the use of full-face masks to environments where a half mask is allowed. Standards from OSHA, ANSI, and other regulatory agencies throughout the world require a fit factor pass level of 500 or more for full-face masks. A pass level of greater than 100 cannot be achieved with any existing qualitative fit test method. The PORTACOUNT accurately measures fit factors up to 10,000.





# FITPLUS Fit Test Software

## New FitPlus v3 Software

This is the ultimate respirator fit test software...and it's included with every PORTACOUNT Plus Respirator Fit Tester! FitPlus v3 Software has all the features you need to make accurate fit testing easy, automated and organized. The updated software prompts the respirator wearer through the required exercise protocol, records the results in a database, prints reports, and more.

Select the worker name, choose a respirator from the list, enter the mask size, and go! The computer takes over from that point on by controlling the PORTACOUNT fit tester and prompting the worker to perform the proper fit test exercises one by one. Since your undivided attention is no longer required, you're free to get the next person ready.

## Complies with Every Regulation

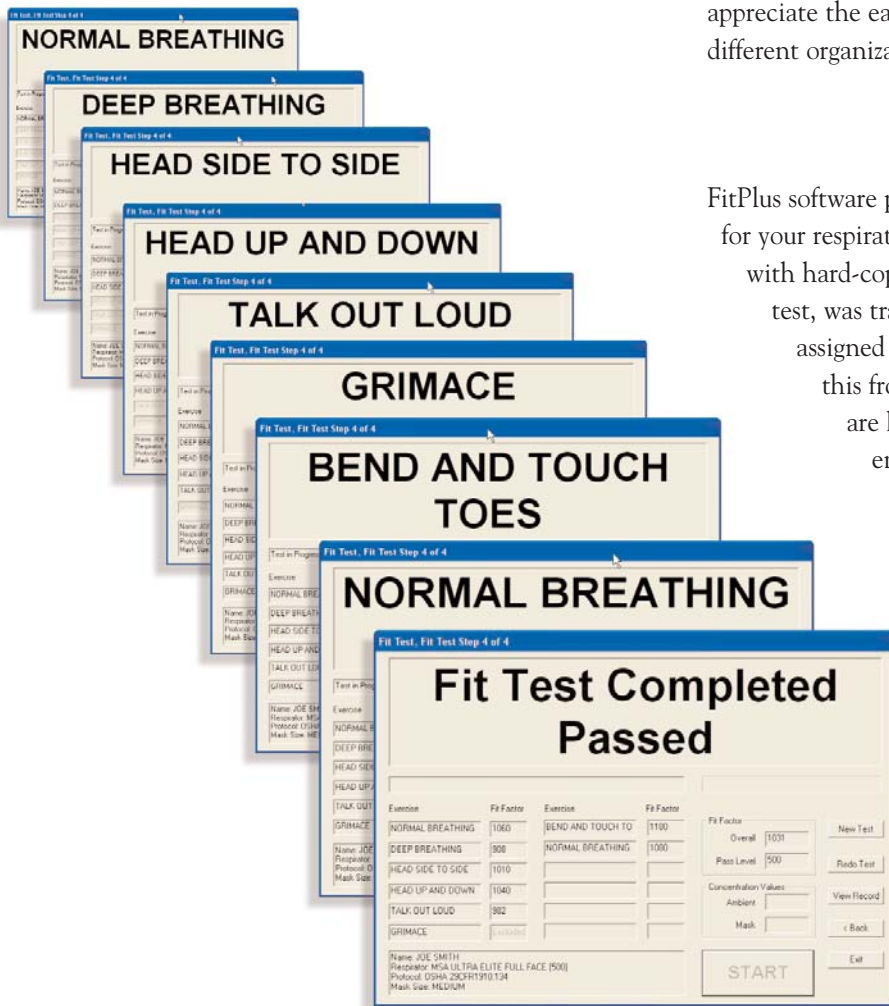
FitPlus software makes fit testing simple for any regulation or standard you need to follow. Fit test exercise protocols from around the world are built into FitPlus software. Choose from OSHA, ANSI, CSA and others. You can even create custom protocols to keep up with new regulations. FitPlus eliminates errors by remembering the last protocol you used and automatically making it the default protocol.

## Recordkeeping

Fit test results are maintained in a database for convenient retrieval and regulatory compliance. Look up and/or print fit test results, review a list of persons due for a fit test, or download results directly into an Excel spreadsheet. You can even print reports showing who's due for a fit test, in addition to customized reports. Consultants and employers alike will appreciate the ease of maintaining separate databases for different organizations or groups.

## Documentation

FitPlus software provides the vital documentation you need for your respirator program. You can provide management with hard-copy evidence that each employee passed a fit test, was trained to don the respirator properly and assigned a mask size that fits correctly. You can't get this from a qualitative fit test because the results are highly operator-dependent and subject to employee deception or misunderstanding.



### Networking

FitPlus v3 supports networking so you can operate multiple PORTACOUNT fit testers while simultaneously sharing the same database. Databases from multiple notebook computers used for independent fit testing can be synchronized with a central computer.

### Training Aid

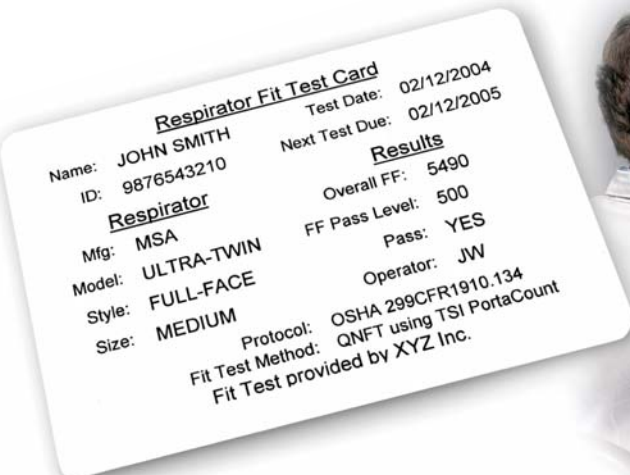
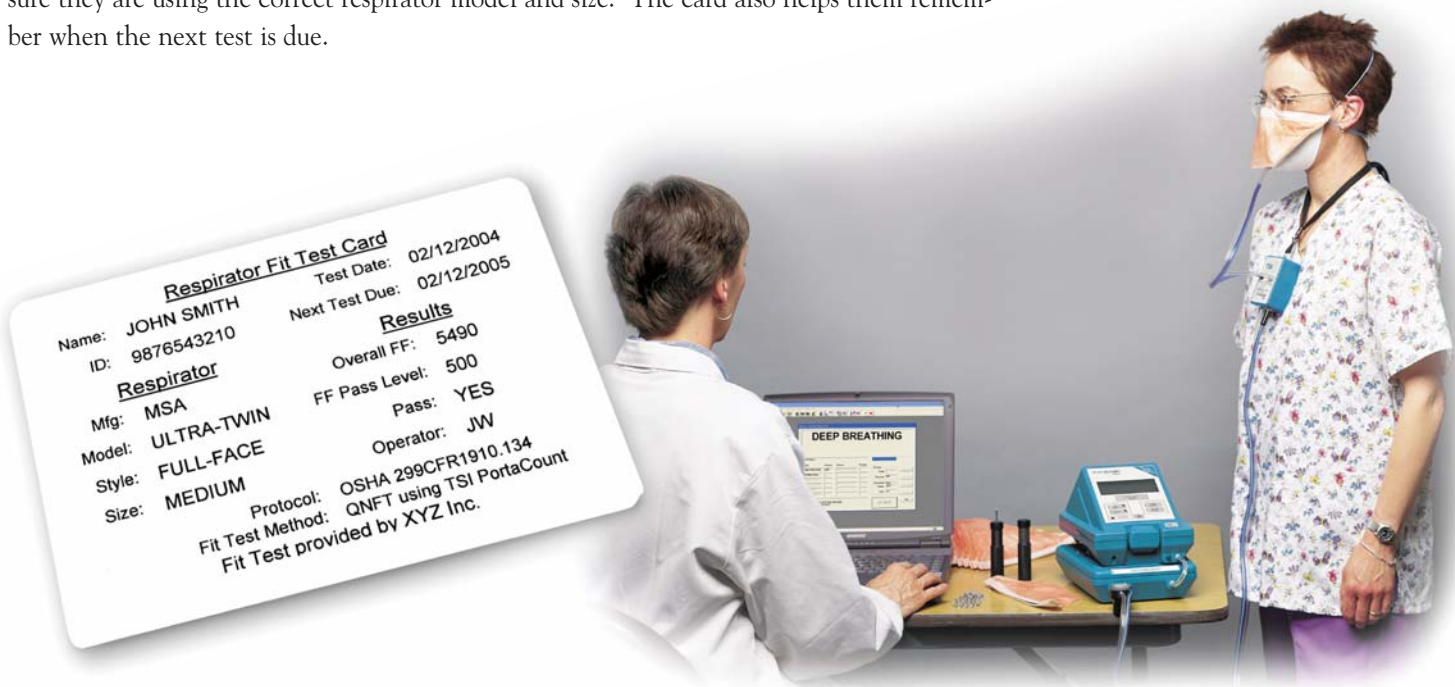
FitPlus software can assist in employee respirator training as well. Use the Real-time Fit Factor Display to show workers the real-time effects of mask positioning and strap tightness as they experiment and learn proper donning procedures. This is especially useful for learning how to properly bend the flexible nosepiece commonly found on filtering-facepiece (disposable) respirators.

### Built-in Backup and Restore

The thought of retesting workers because a computer malfunction wiped out the database is an employer's nightmare. FitPlus v3 helps protect your valuable fit test records with built-in backup and restore functions. Create backup files at will and store them locally or, better yet, on a remote networked PC.

### Print Fit Test Cards (with optional card printer)

FitPlus v3 allows you to automatically print fit test cards for everyone you fit test. This is a convenient way for workers to carry verification that they passed a recent fit test and to make sure they are using the correct respirator model and size. The card also helps them remember when the next test is due.






# The ideal way to fit test N95 PORTACOUNT Plus and the

Advanced technology from TSI makes it possible for you to use the PORTACOUNT Plus to quantitatively fit test N95 disposable respirators. You no longer have to mess with the tedious and error-prone qualitative methods like saccharin, Bitrex, and irritant smoke. The N95-Companion works with the PORTACOUNT Plus to provide you with a complete solution to all of your fit testing needs. Use the PORTACOUNT alone for masks equipped with Series-99 and Series-100 filters. Simply add the N95-Companion to fit test masks with Series-95 filters, including the popular N95 filtering-facepiece disposables. When necessary, you can disconnect the N95-Companion in a matter of moments and use the PORTACOUNT Plus alone. The N95-Companion is simply an accessory for the PORTACOUNT Plus. The fit factor measurement is made by the PORTACOUNT. When the N95-Companion is attached, the PORTACOUNT uses only a small portion of the particles in the ambient air.



**Model 8028 PORTACOUNT Universal Fit Test System**  
 PORTACOUNT Plus Model 8020 and N95-Companion  
 Model 8095 together let you fit test any tight-fitting respirator.



Facepiece Style	Use PORTACOUNT Alone (Model 8020)	Use N95-Companion with PORTACOUNT (MODEL 8028)
 Full Face SCBA Gas Mask	✓	
 Half-mask	✓	
 Series-100 Disposable Series-99 Disposable Series-95 Disposable (TB-Masks)	✓ ✓	✓

PORTACOUNT Plus/N95-Companion Respirator Compatibility



# disposable respirators the N95-Companion

## *How it works*

The N95-Companion contains an electrostatic particle classifier. The particle classifier takes advantage of electrostatic charges that exist on ambient particles to strip out a predetermined particle size range of interest, from the broad range of sizes present in ambient air. The resulting particles leave the N95-Companion and are transported via flexible tubing to the PORTACOUNT for counting.

The PORTACOUNT, seeing only the particles of interest, then compares the number outside the mask to the number inside the mask. This ratio of particles counted is the fit factor. For a detailed explanation of the theory of operation, see TSI's application bulletin ITI-053.



\*Once probed, disposable respirators cannot be sanitized or used for respiratory protection. They must be discarded after each fit test. Additional probe sets are available from TSI in packages of 500.

There is no need to obtain pre-probed respirators from your respirator manufacturer. The N95-Companion comes with a set of tools and a supply of probe sets for installing your own sampling ports onto any filtering-facepiece respirator\*. It only takes a few seconds!

## *Model 8026 Particle Generator*

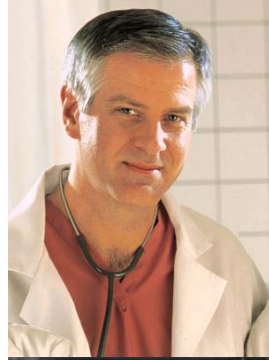
Some locations may not contain a naturally-occurring ambient particle concentration of at least 70 particles/cc in the size range required by the N95-Companion. This is often due to high-efficiency filters found in some specialized building ventilation systems. To address this situation, the Model 8095 N95-Companion Kit comes complete with a Model 8026 Particle Generator\*\*. The particle generator produces a non-detectable, low concentration salt (NaCl) aerosol in the proper size range for the N95-Companion. Since the aerosol output of the particle generator is limited, its use restricts fit testing activities to an average-size room.



## *Is your PORTACOUNT Plus N95-Companion ready?*

The N95-Companion can only be used with a PORTACOUNT Plus Model 8020 that has the "revision A" modification, as indicated by the model number designation "8020A" located on the serial number tag. Contact TSI about converting your PORTACOUNT Plus, if necessary.

\*\*The Model 8026 Particle Generator is also available separately for PORTACOUNT users who need to supplement ambient particle counts, but do not have use for the N95-Companion.



## Specifications

### PORTACOUNT Plus Model 8020 Respirator Fit Tester

Fit Factor Range	1 to greater than 10,000
Concentration Range	0.01 to $5 \times 10^5$ particles/cm <sup>3</sup>
Particle Size Range	0.02 to greater than 1 micrometer
Typical Fit Factor Accuracy	±10% of reading
Size	9.5 in. × 7.5 in. × 5.5 in. (24 cm × 19 cm × 14 cm)
Weight	
Unit Only	3.3 lb (1.5 kg)
With Standard Accessories and Case	13 lb (5.9 kg)
Power	Autosensing 100 to 250 VAC, 50 to 60 Hz
Flow Rate	
Sample	100 cm <sup>3</sup> /min
Total	700 cm <sup>3</sup> /min (nominal)
Temperature Range	
Operation	32 to 100°F (0 to 38°C)
Storage	-40 to 160°F (-40 to 70°C)
Alcohol	
Hours Per Charge	8 hours at at 70°F (21°C)
Alcohol Type	99.5%+ reagent grade isopropyl
RS-232 Output	
Baud Rate	User-selectable: 300, 600, 1200, 2400, 9600 (factory set at 1200)
Carrying Case	
Size	21 in. × 14 in. × 8.3 in. (53 cm × 36 cm × 21 cm)
Pass/Fail Setting	User-selectable: 0, 100, 250, 500, 1000, 1250, 1667, 2000, 4000, 5000, 6667, 10000 (other values can be programmed by user)
Factory Recalibration Interval	One year
Warranty	Two years on workmanship and materials

### FitPlus Fit Test Software (included with PORTACOUNT Plus)

#### Minimum PC Hardware Requirements

- Microsoft Windows 2000 or XP
- RS-232 serial port or USB to serial converter

### Optional Accessories

- Model 8095 N95-Companion
- Model 8026 Particle Generator (included with N95-Companion)
- Sampling adapters for select respirator models
- Card printer

Specifications are subject to change without notice.

### Model 8095 N95-Companion Accessory

Fit Factor Range	1 to 200
Concentration Range	0.01 to $5 \times 10^5$ particles/cm <sup>3</sup>
Test Particle Size	0.04 micrometer (nominal)
Typical Fit Factor Accuracy	±10% of reading
Size	9.5 in. × 7.5 in. × 2.3 in. (24 cm × 19 cm × 58 cm)
Weight	2 lb (0.908 kg)
With Accessories and Case	13.5 lb (6.1 kg)
Flow Rate	700 cm <sup>3</sup> /min (nominal)
Temperature Range	
Operation	32 to 100° F (0 to 38°C)
Storage	-40 to 160° F (-40 to 70°C)
Carrying Case	
Size	19 in. × 15 in. × 6 in. (48 cm × 38 cm × 15 cm)
Pass/Fail Setting	User selectable: 0, 10, 25, 50, 100, 125, 166, or 200 (other values can be programmed by user)
Factory Recalibration Interval	One year
Warranty	Two years on workmanship and materials

Licensed under US Patent No. 5,117,190 and other patents from Commissariat a L'Energie Atomique, France. U.S. Patent No. 6,125,845. Other patents pending.

### Model 8026 Particle Generator (included with N95-Companion)

Size	9 in. × 3.5 in. × 5 in. (23 cm × 9 cm × 13 cm)
Weight	2.75 lb (1.25 kg)
Particle Size	Poly-disperse, sodium chloride
Power	115 or 230 VAC (specify when ordering)
Warranty	One year on workmanship and materials

### Model 8028 PORTACOUNT Universal Fit Test System

Order the PORTACOUNT Plus and N95-Companion together as the Model 8028 PORTACOUNT Universal Fit Test System



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