

## Using Fit Validation to Help Improve Field Performance of Hearing Protectors and increase Compliance

The chosen hearing protector (earplug or earmuff) won't provide the expected level of protection if it is not fitted or used correctly. To make sure your workers are adequately protected, you need to know the Personal Attenuation Rating (PAR) achieved by the individual wearer. Every employee is different. Every job is different. Every ear is different.

Once you know each employee's PAR value you can use this information to check if they are using the correct hearing protectors for to best suit the individual wearer and the workplace environment with due consideration for over-protection.

The 3M™ E-A-Rfit™ Dual-Ear Validation System is designed to help validate hearing protection and compliance.

It is an objective quantitative method for measuring the individual wearer's attenuation value to ensure the chosen hearing protector is correctly matched to the worker and the workplace environment. The 3M™ E-A-Rfit™ Dual-Ear Validation System features Field Microphone In Real Ear (F-MIRE) technology for fast, accurate and efficient way of measuring an individual's PAR value. The system can measure both ears in few seconds to provide the binaural value.



With the 3M™ E-A-Rfit™ Dual Ear Validation System your employees will learn how to properly fit their 3M earplug or earmuff and you'll have the confidence that they are wearing the right protection for their environment. And because you can simultaneously test both ears, you'll have more time to educate employees on the importance of correct fit and thus help increase compliance.

The acoustic seal provided by an earmuff may be degraded by using safety or prescriptive eyewear as well as goggles or respirator straps, for example. The 3M™ E-A-Rfit™ Dual-Ear Validation System allows you to assess the impact of using additional personal protection equipment and to identify the most appropriate compatible system.

The 3M™ E-A-Rfit™ Dual-Ear Validation System uses a proven technique to measure how well the hearing protector is working for each employee. The noise reduction provided by the hearing protector is measured directly and objectively for both ears simultaneously from inside the employee's ears, without the need for the employee to listen or respond to the test signals. As such no special facilities (e.g. sound booth) are required to carry out measurements making the system extremely versatile and easy to use in any workplace setting.



The system tests both ears for all seven standard frequencies (from 125 Hz to 8000 Hz) in seconds and once the measurement is completed, the software calculates and displays an overall performance rating for each employee, known as PAR value. It also displays a pass/fail indicator based on the worker's noise exposure level. A "fail" result means the hearing protection is either not inserted properly or is the wrong type or size for the worker's ear canal. A "pass" result means the hearing protection is selected and inserted correctly and provides sufficient protection for the worker's specific job.



### **Three Steps**

The testing is completed in three easy steps.

#### **Step 1: Workers self-fit their own earplugs or earmuffs.**

The employee inserts a surrogate 3M hearing protector (specially probed earplugs or earmuff cushions) to help facilitate the measurement of individual's PAR value. This process reflects an individual's fitting methods and indicates if additional training is necessary.

#### **Step 2: Connect to the unique dual-element microphone.**

Connect the dual-element microphone to the specially adapted earplug or earmuff. The loud speaker produces test sound which is simultaneously picked up by the dual-end microphone to provide the measure of the sound level inside outside of the hearing protector. The difference between the two values is the individual's personal attenuation rating.

### **Step 3: Run the Test for Personal Attenuation Rating (PAR)**

Patented system and proprietary algorithms quickly analyze real-time data to provide individual's PAR values and fit variability. These PAR values can assist in determining if the level of protection achieved by the workers are appropriate to their work environment. The test results are easy-to-understand and are documented for each test subject, both in print and electronic formats, for future reference.

### **Fit to Hearing Conservation Program**

The 3M™ E-A-Rfit™ Dual Ear Validation System fits seamlessly into a hearing conservation program. Integrating hearing protection fit testing benefits everyone from new hires to high-risk workers. Here are three options for incorporating the E-A-Rfit™ Validation System into a hearing conservation program. These three options have been designed to suit the needs of employees and environments present in the majority of hearing conservation programs. Naturally, a program designed around your workplace's particular needs could specifically address your and your employees' specific needs.

#### **Audit**

The 3M™ E-A-Rfit™ Dual-Ear Validation System may be used to simply audit the protection achieved by a group of employees. With this application, wearers are just asked to fit their earplug as they normally would, and a single E-A-Rfit™ measurement is taken.

- Establish baseline values for new workers
- Helps identify workers receiving inadequate protection that leaves them at risk of threshold shifts
- Validate high protection levels required by workers in high noise areas

#### **Fit, Train & Motivate**

The Fit & Train Mode utilizes the E-A-Rfit™ System to provide fit training with repeat measurements, and more regular checks, including follow-up confirmation testing. This application is an ideal way to optimize the use of the system.

- Provides tool for training proper fitting techniques and to assess proficiency
- Motivates employees by helping them realize the control they have in protecting their hearing

#### **Assess & Manage**

For optimized approach in predicting employee protection and enhancing individual use and performance, we recommend the comprehensive Assess & Manage Mode. This application recognizes that the more measures that are taken on each individual, the better will be the personal predictions, to the extent that the individual conscientiously tries to fit the hearing protection device consistently each time.

- Improves long term performance of your hearing conservation program
- Indicates employees needing further fit training or alternative hearing protectors
- Input your noise exposure data and the 3M™ E-A-Rfit™ Dual Ear Software can help you identify the most appropriate hearing protection and help minimize over/under protection

The 3M™ E-A-Rfit™ Validation System includes all the hardware and accessories needed, including a speaker, software, stand, dual-element microphones, cables and a trial quantity of probed test plugs.