

Discover the Science of Respiratory Protection

Respiratory protection and safety go hand in hand. Safety is critical. Effective respiratory protection should be engineered by science, in order to help achieve respiratory protection that is safe, effective, fits properly, comfortable, durable, and able to achieve approval by the appropriate regulatory body. When evaluating respiratory protection options for workers in North America, ask yourself, has the respiratory protection you are considering been certified by the National Institute for Occupational Safety and Health (NIOSH)? Does what you are selecting meet the requirements of your job and will it help protect you from the hazards you may face?

Respiratory protection can be challenging because often you cannot see what it is that could harm you. Also, when exposed over time, there are many hazardous contaminants that have been associated with long-term health problems, for example exposure to contaminants such as [welding fumes](#), isocyanates, and/or other substances like silica dust. Look for a manufacturer that considers multiple, varied types of jobs, tasks, applications, and workers when engineering respiratory protection. An exposure assessment is key to understanding the hazards and what protection is required.

Choosing the right respiratory protection for your application is a vital step when it comes to your safety. You want to know you are picking a quality product, but how? Here are some signs that respiratory protection products have been engineered using extensive science.

Disposable Respirators (DR), Filtering Facepiece Respirators (FFRs)

Consider the science, technology and testing that goes into developing filter media that can be found in 3M DR products:

- Proprietary Advanced electret media, which enables for greater airflow while capturing contaminants in the electrostatically-charged microfibres
- Carbon filters for relief from certain nuisance odours
- Oil resistant for applications with oil mist
- Flame resistant for applications like metalworking
- For some models cake resistant for longer-lasting, easier breathing [comfort](#) when performing tasks during welding

Make sure you do your research and consult with knowledgeable health and safety specialists who can help you select respiratory PPE that can help protect you while on the job.

Reusable Respirators (RR) Elastomerics

When it comes to reusable respirators (RR), there may be many options out there, but look for a [global manufacturer that has developed a wide range of cartridges, filters, and materials](#) that help provide consistent protection for many industries. You should work with a reputable manufacturer that not only can help provide assistance in helping you choose your appropriate RR but can also help you estimate the service life of the necessary respirator cartridges.

There is also a lot of science that goes into developing RR models. There are some models that are lightweight. There are RR that is designed to be durable and can provide protection for demanding conditions. From low maintenance half facepiece RR options to full facepiece RR models that allow for wide visibility, there are RR options that offer a wide range of protection levels (Assigned Protection Factors [APF]) as well as a whole host of features that have been extensively developed to help provide a comfortable fit and seal. This includes the science around pressure drop that affects breathability. Cool-Flow™ valve or exhalation valve may help reduce heat, moisture build up, and fogging. There are also models that have a speaking diaphragm to help you communicate while you work.

The Science of Fit


Speaking of fit, it should be core to the scientific development process when it comes to respiratory PPE. 3M product developers spend extensive time working in the lab throughout the development process, investigating the impact of design iterations on the fit performance of new respirator concepts, always aiming to learn and advance.

Fit testing is a crucial component of DR/FFR and RR PPE. For instance, 3M pioneered the creation of the saccharin qualitative fit test protocol – the first qualitative fit test for filtering facepiece respirators based on taste of a test agent. Make sure you understand fit considerations when selecting and using respiratory protection and how to properly conduct a fit-test.

As a safety professional, running an effective respiratory protection program means navigating a network of regulations and anticipating and identifying hazards.

Powered Air Purifying Respirators (PAPR) and Supplied Air

Not only do PAPR systems use a blower instead of lung power to draw air through the filter, but different jobs call for different kinds of headtops to help protect workers from hazardous environments. The science behind trusted PAPR systems has led to this type of respiratory PPE being widely adopted in a wide variety of industries from



healthcare to sanitation, painting, and shipbuilding because a high assigned protection factor (APF) can be achieved when a PAPR system is used properly. The same can be said if you have access to an onsite source of Grade D breathing air since supplied air systems can also be delivered to various hoods, helmets, full facepieces, half facepieces and loose-fitting facepieces.

Moreover, there are PAPR systems that combine respiratory, head, eye and face protection, which can be customized for different work environments. Some global manufacturers understand that every worker is different, and each day their tasks can change. As the owner of an integrated PAPR system, workers have a variety of accessories available to help deliver protection and comfort.

If you use this type of system, make it a regular habit to check your equipment and work with a manufacturer who can help you understand the proper care and maintenance techniques to extend the life of your system and can help advise you about the right replacement parts to help you maintain protection.

Need Help Selecting Respiratory PPE? We're Here for You.

There is a lot of science that goes into respiratory protection and a lot of choice out there. Respiratory protection should be designed to help give you peace of mind and confidence that you can perform your job and return to your family safely at the end of the day. It's not just about safety, but your health. When making the choice of what type of respiratory protection products to use look for a manufacturer that offers science-based, innovative solutions. For help selecting respiratory protection, please do not hesitate to reach out to our respiratory protection specialists for assistance today.