



Negative vs. Positive Pressure PAPR Respirators

Before we decide which of the two options is better, we need to first understand what respirators fit into each category. A negative pressure device depends on the worker to breathe through a filter to purify the air. It could be a disposable respirator, a ½ mask respirator or a full facemask:



The latter two devices could offer protection against particulates, gases, vapors, or a combination of these, depending on the filter or cartridge selected. A powered air purifying system will offer the same protection as a negative pressure device with the same range of filters offered, but commonly you can be protected to even higher levels of contaminants. The only difference is that a powered system uses a motor, battery, and fan to do the work for the wearer.

A negative pressure device typically requires the wearer to use other forms of face protection such as eye protection (for a disposable and ½ mask), head protection and hearing protection, or a combination of them depending on the task. The challenge here is compatibility, as eye and face protection commonly will fog up when using these devices (but not on the full facemask shown above).

Similarly, we sometimes worry about employees breaking the seal of these negative pressure devices, rendering them useless when this happens. Your respiratory protection is completely dependent on getting a good seal to the face. Facial shape, facial hair, and scars can all contribute to making it difficult to ensure this tight seal. Employees must be “Fit Tested” with a safe chemical substance to help us ensure this seal can be maintained by the employee during their daily work activities (this “fit test” must be completed once per year). The Safety Services Team at Conney performs hundreds of these fit tests for our customers every year.

It takes a lot of effort to draw air through a filter to make it work. Some countries even require that workers wearing negative pressure devices for longer than an hour should take a 15-minute break! It is not considered safe for an employee suffering from asthma to use this type of device because it could cause undue pressure to the heart (that is why all employees must pass a “medical evaluation” before being allowed to be fit tested with these respirators - <https://www.conney.com/pages/TRAINING>).

A powered air system (PAPR – powered air purifying respirator) can potentially offer complete head/eye/hearing and respiratory protection with total compatibility and no risk of fogging to the lens. Similar to a negative pressure device, it draws the contaminated air through filters that purify the air. However, this system uses a fan to do the work for the wearer, enabling the wearer to complete their tasks with minimum effort (easier on the lungs and the worker is commonly more productive).

While these PAPR units cost more to purchase, we need to look at the big picture of how it might benefit the worker:

- 1) Greater comfort – easier on lungs
- 2) Better productivity
- 3) No fogging issues
- 4) Higher protection level (referred to as “protection factors”)
- 5) No need to “fit test” the employee every year

- 6) Most facial hair is allowed with these products – allowing employees to maintain a beard that does not break the seal of the PAPR at the elastic shroud seal
- 7) Wide variety of applications (welding, painting, general purpose where any standard air purifying respirator could be used)

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