

Respiratory Protection

Respirators Defend Your Lungs

Your body works hard to protect your respiratory system from airborne contaminants. Your nose begins the job by filtering out *large* particles and warming and moistening the air as it enters your body. A blanket of *mucus* lining the tubes to your lungs traps smaller particles, which are moved back up toward your throat by the action of tiny hairs, called cilia, that line your air passages. Your cough reflex completes the task of getting rid of contaminants. That's why smoke and dust make you cough—your body is just *doing* its job. Your lungs then move the 20% of the air that is pure oxygen into your bloodstream where your body can use it.

When You Need a Respirator

But what if your body's air filtration system is bombarded with too many contaminants? When your air passages are overloaded, they will not be able to prevent this material from getting to your lungs. Contaminants can have an immediate and noticeable effect when they irritate your lungs, but much more dangerous are the long-term effects of a buildup of contaminants over time. Often a victim of this sort of hazard is not aware of the problem until the lungs are damaged permanently. Fortunately, respirators can prevent this kind of damage by filtering out these particles for you.

Air-Purifying Respirators

If you are working in an environment that produces dusts, fumes or harmful mists, you should be using an air-purifying respirator (APR) containing a filter designed for screening out these contaminants. These may be simple disposable face masks or rubber masks fitted with disposable or cleanable filters.

Cartridges and Canisters

Gases and vapors make up another group of health hazards. These substances are not really particles—they are dissolved in the air, so your air passages have no way of getting them out. Furthermore, such gases can pass through your lungs to enter your bloodstream, damaging your body and brain. When working around these hazards, you need an APR fitted with



a cartridge or canister that absorbs or chemically reduces dangerous gases. The type of cartridge or canister you use must be specific for the gas in your work area—the wrong one will have no safety effect at all. And it must be replaced according to manufacturer's guidelines when it is used up.

Supplied-Air Respirators

Remember how much oxygen there is in pure air? That's right—20%. If the atmosphere in your workplace has such a high level of contaminants that

there is not enough oxygen left in the air to support life, it will not do any good to filter the air. You need to replace that air with an outside source. Supplied-air respirators (SARs), also called air-line respirators, connect the user, by means of an air hose, to an outside source of clean air supplied by a compressor or compressed-air cylinder. You may also need this type of respirator if the contaminant in your workplace cannot be filtered or absorbed by ordinary APRs. Other situations requiring SARs are oxygen deficient environments and environments that are dangerously hot or cold or so toxic that they have been identified as "immediately dangerous to life and health" (IDLH). Under IDLH conditions you must use a respirator that provides positive air pressure so there is no chance of contaminants being drawn into the mask when you inhale.

Self-Contained Breathing Apparatus

Sometimes working conditions do not permit the use of air lines. With a self-contained breathing apparatus (SCBA) you carry a supply of air in a portable tank on your back. Use SCBAs when you need great mobility, when falling objects or machinery can damage an air hose, or when the job to be done takes 30 minutes or less. They may also be used when you are first entering an environment in which the air quality is unknown.

If your lungs are the gateway to your body, your respirator is like a guard at the gate. In order to protect yourself, you must make sure your guard is armed with the right weapons. This means choosing the appropriate respirator for your working environment. □