

MAJOR PROGRAM POINTS

"RESPIRATORY PROTECTION AND SAFETY"

**Training for the
OSHA RESPIRATORY PROTECTION STANDARD**

Quality Safety and Health Products, for Today...and Tomorrow

OUTLINE OF MAJOR PROGRAM POINTS

The following outline summarizes the major points of information presented in the program. The outline can be used to review the program before conducting a classroom session, as well as in preparing to lead a class discussion about the program.

- **In today's world, we come in contact with more airborne contaminants than ever before.**
 - In the U.S. alone, more than 5 million workers wear respirators on the job.
 - Still, over 66,000 U.S. workers suffer severe exposure to airborne contaminants each year.

- **Contact with these contaminants can lead to:**
 - Blindness.
 - Lung damage.
 - Cancer.
 - Asbestosis.
 - Other serious illnesses.

- **Because of the severity of these problems, the Occupational Safety and Health Administration (OSHA) has created a regulation to protect workers from respiratory hazards.**
 - The regulation can be found in 29 CFR 1910.134.

- **One of the things that the regulation stresses is learning about respiratory hazards. They fall into three major groupings:**
 - Dust, mist and fumes.
 - Gases and vapors.
 - Oxygen deficiency and temperature extremes.

- **Dust, mist and fumes are tiny particles that were once parts of a larger mass.**
 - Later they were separated from their "parent" substances and became airborne.

- **Dust is produced when solid materials are broken down into fine particles during activities such as:**
 - Woodworking.
 - Crushing.
 - Grinding.

- **Mist is made up of droplets that are suspended in the air.**
 - These are created when pressurized liquids are sprayed.

- **Fumes are composed of solid particles given off when metals or plastics are heated, as in:**
 - Welding.
 - Furnace operations.

- **Unlike dust, mist and fumes, gases and vapors do not result from materials being fragmented. Instead, they are created by changes that take place on the molecular level.**
 - For example, gases occur when a substance is heated beyond a certain point.
 - As a result, the space between its molecules increases... and its density sharply decreases.
 - At the same time, it expands, becoming diffused through the air.

- **The molecules forming the gas are not separate from the material... the gas is the same substance, but in a different state.**

- **Materials can sometimes also exist in more than one state at the same time.**
 - For instance, a liquid can be heated to the point where only part of it is gaseous.
 - When this happens, the gaseous part is often referred to as a vapor.

- **Both gases and vapors can cause immediate irritation when they are inhaled.**

- **The final group of respiratory hazards includes:**
 - Oxygen deficiency.
 - Temperature extremes.

- **Oxygen deficiency occurs most often in confined spaces, and is caused by:**
 - Chemical reactions.
 - Fire.
 - Gases that push breathable oxygen out of the area.

- **A lack of oxygen can cause unconsciousness or even death in a matter of minutes.**

- **Temperature extremes can also be very dangerous.**
 - Hot air can burn your airway and prevent oxygen from being absorbed by your lungs.
 - Severe cold can freeze your lungs and respiratory tract and make it impossible to breathe.

- **To protect you from these hazards your body uses its natural defenses.**
 - During normal breathing, fresh air is drawn in through the nose, where coarse hairs trap large particles that have become airborne.
 - Next, the air comes in contact with a blanket of mucus and cilia (tiny hairs which line the respiratory tract.)

- **The mucus and cilia push the smaller particles to the back of the throat. There they are either:**
 - Swallowed.
 - Expelled by coughing.

- **Your respiratory system is an effective defense against normal hazards like house dust and pollen.**
 - But more dangerous substances, like poisonous gases and vapors, can sneak past our defensive system.
 - They can potentially damage your internal organs... even your brain.

- **When you work around respiratory hazards you need to be "combat ready". This means:**
 - Being aware of potential problems.
 - Reading the Material Safety Data Sheets (MSDSs) and container labels.
 - Following all safety procedures.

- **To begin this process, your safety department will run tests on your work environment to determine whether respiratory hazards exist. If necessary, they will:**
 - Install air processing systems that filter the air.
 - Set up emergency respirator stations.

- **Other engineering controls, such as lab hoods, can also help to keep the air you breathe clean.**

- **Environmental controls can reduce airborne contaminants too.**
 - For instance, spraying water on dusty surfaces will limit the amount of particulates that float into the air.

- **But even with systems like these in place, you still may encounter situations where more protection is needed.**
 - These conditions require you to wear a respirator.
 - However, if you suffer from a heart condition or asthma, you should not work in areas where respirators are required unless you have the proper medical clearance.

- **The respirator you use must be right for the job that you do. Depending on your type of work, you will use a respirator that:**
 - Filters the air you breathe.
 - Purifies the air through chemical means.
 - Provides its own source of breathable air.

- **OSHA's "Assigned Protection Factors" (APFs) will help your employer determine what respirator should be used in your work environment.**
 - APFs indicate how much protection various types of respirators provide.
 - In most situations, an air-filtering respirator is what will be called for.

- **Because oil-aerosols can sneak through certain types of filtering systems, NIOSH has created three filter classifications, based on the amount of oil-aerosols present on the work site.**
 - If there are oil-aerosols present, you must use a filter that is coded P (for oil-proof) or R (for oil-resistant).
 - If no oil-aerosols are present, you can use an N coded Filter (not-oil-proof).

- **When using any filter, make sure to follow all of the manufacturer's recommendations.**
 - Pay special attention to the suggested "time use limits."

- **Once your employer has determined whether you should use an N, R or P series filter, you will need to make sure that the filter you select is also strong enough to block the airborne hazards you are working around.**
 - The strength of a filter (also referred to as its efficiency) is listed in percentages.
 - They include 95%, 99% and 99.7%(which is referred to as 100%).
 - The higher the number, the greater the efficiency.
 - But remember, it is more difficult to breathe through higher rated filters, so do not use a higher rating than you need.

- **Talk to your supervisor to see which efficiency will best protect you at your work site.**

- **For easy identification, OSHA requires that all filters and cartridges:**
 - Be color-coded.
 - Include approved labels that display the NIOSH rating.

- **A cartridge respirator is not usually needed in areas where low levels of dust are the primary respiratory problem.**
 - Here a disposable mask can be used
 - Fibers in the mask trap and hold particles.

- **To get a proper fit:**
 - Adjust the metal strip to conform with the bridge of your nose.
 - Make sure the straps are not tangled.
 - Place one strap below the ears and the other above them (this creates an even tension on the mask and provides the best seal).

- **When your mask becomes clogged with dust, throw it away and get a new one.**

- **However, where more protection is required you will need to use an air-purifying respirator.**
 - These have disposable cartridge filters that capture gases and vapors through chemical means before they are breathed in.
 - Remember, before using any air-purifying respirator check with your supervisor to see whether you need to use a P, R or N series filter.

- **Whenever there is a high amount of dust or other particulates in the air, you may want to attach a pre-filter to your respirator.**
 - This traps the particles before they are absorbed by the cartridge filter.

- **You can get even more protection by using a full-face mask respirator.**
 - It will guard against hazards could irritate your eyes and skin.

- **Sometimes air-purifying respirators don't offer enough protection.**
 - In these situations you need an independent source of breathable air.

- **Supplied-air respirators (SARs) are attached to a compressor that provides air through a hose. They are used where:**
 - Hazardous substances are highly concentrated.
 - There isn't enough oxygen.

- **Another respirator that provides its own air is the self-contained breathing apparatus (SCBA).**
 - These allow for greater mobility than SARs, since the air supply is carried in a tank on your back.
 - An SCBA's breathing air usually lasts for 30 to 60 minutes, although newer designs allow for significantly longer periods.
 - How long your tank will actually last will depend on your weight and the stress that your job puts on your body.

- **Before you put on an SCBA, make sure the air tank is fully charged.**
 - Always check your air supply gauges.

- **Working with SCBAs and SARs can be stressful.**
 - When using them watch out for physical problems that may affect you and your coworkers.
 - For instance, it can be easy for someone who is wearing heavy equipment to tire quickly or be overwhelmed by heat exhaustion.

- **If you wear an SCBA to fight fires you must follow special procedures set up by OSHA.**
 - OSHA requires that at least two firefighters enter a "burning area".
 - They must remain in visual or voice contact with each other at all times.
 - At least two responders must also be stationed outside the danger zone.

- **Whatever type of respirator you wear, check all of its parts before putting it on.**
 - Look for wear or damage.
 - Inspect for holes.
 - Make certain all connections are tight.
 - Examine the straps and the seal of the face-piece.

- **At least twice a year you should also have your safety department check you for a proper fit.**
 - Even a tiny gap can let in hazardous gases and vapors.

- **Whether your job requires you to wear SCBAs, cartridge respirators or dust masks, OSHA mandates that your employer create a written "Respiratory Plan."**
 - This outlines the respiratory requirements of the jobs at your work site.
 - The plan has to be readily accessible to you and your coworkers.
 - Your employer will periodically review the plan to ensure that it is up-to-date with current OSHA and NIOSH regulations.

- **OSHA also requires your employer to arrange a medical evaluation for you before you wear a respirator.**
 - The evaluation will be conducted by a licensed healthcare professional.
 - It will determine whether you can safely use a respirator.

- **When you select a respirator, pick one that conforms to your face.**
 - Your employer will have at least three different sizes to choose from.
 - Make sure the mask is comfortable.

- **Your employer will show you how to correctly position and adjust the mask for an effective seal.**
 - The straps should not have to be pulled uncomfortably tight to keep the mask in place.
 - The mask does need to fit snugly however, since the seal blocks contaminants from reaching your respiratory system.

- **There must be no gaps between the respirator and your face.**
 - Standing in front of a mirror is a good way to check for openings.

- **Even after fitting and testing, your respirator may still feel bulky and awkward.**
 - Getting used to one takes time.
 - If you practice wearing your respirator at least five minutes a day you will soon be comfortable with it.

- **When you wear your respirator, make sure that you can be understood when you speak.**
 - Test this by reading something aloud to your supervisor.
 - When you are in a hazardous environment, never remove your mask to talk (this could be fatal).

- **OSHA also requires all employees to undergo a formal "fit test" before they wear a respirator.**
 - Fit-testing ensures that the respirator really does fit tightly against your face.

- **There are two types of fit-testing:**
 - Qualitative.
 - Quantitative.

- **Qualitative testing uses scented chemicals or smoke sprayed into the air.**
 - If you can't smell the chemicals, you probably have a good fit.
 - The problem with qualitative testing is that it is subjective, since it relies on each person's sense of smell.

- **Quantitative testing is much more accurate.**
 - This uses a machine to measure the exact amount of material that makes its way into your respirator.

- **Even after the qualitative or quantitative fit tests have been performed, you should still test your respirator's seal each time you wear it.**
 - This can be done by performing a "User Seal Check", which uses both positive and negative pressure to test how well the respirator seals to your face.

- **To check the seal using positive pressure:**
 - Place the palm of your hand over the exhalation valve of the respirator.
 - Gently breathe out.
 - If you feel a build-up of pressure beneath the mask, and see the side of the face-piece bulge out slightly, you have a good seal.

- **To check the seal using negative pressure:**
 - Place both hands over the inhalation valves and breathing in gently.
 - The face-piece should collapse slightly against your nose.
 - Hold your breath for 10 seconds.
 - If the mask stays collapsed, you have a good seal.

- **You must perform "User Seal Checks" every time you wear your respirator.**
 - This is to insure that nothing has happened to change the way it seals to your face.

- **There are several types of problems that could affect the seal, including damage to parts of the respirator such as the face-piece.**

- **Even certain changes to your face can affect how your respirator fits.**
 - For instance, facial hair, including long sideburns, can interfere with a mask's ability to form a tight seal.
 - Dentures, scars and other physical impairments on the face can affect face-piece seals as well.

- **Eyeglasses can also affect respirator seals.**
 - If you wear glasses and use a full-facemask respirator, you will need to install a NIOSH-approved "eyeglass modification kit".
 - After installing the kit you must fit-test the respirator again.

- **Be sure to talk to your supervisor or your medical department if you wear glasses and need to wear a full-facepiece respirator.**
 - Your safety depends on it.

- **Proper care of your respirator is essential.**
 - Following recommended cleaning and disinfecting procedures will keep your respirator... and you... in good working condition.

- **The OSHA-approved cleaning procedure begins with removing all filters, cartridges and canisters.**
 - Next, remove the straps.
 - If your respirator uses hoses, check them for defects.
 - Check all valve assemblies too.
 - If you find any defective pieces, repair or replace them immediately!
- **Wash all parts of the respirator in warm water, using a detergent recommended by the manufacturer.**
 - If you need to remove dirt, use a stiff bristle brush.
 - Never use a wire brush, however (it could seriously damage your respirator).
- **Once you have washed everything, thoroughly rinse all of the parts with warm running water.**
 - When the dirt is gone, do not forget to rinse away all of the detergent.
 - Detergent residue can dry and crack rubber, and corrode metal.
- **Hand dry all of the pieces with a lint-free cloth.**
 - Reassemble the respirator and test it.
- **Respirators worn by only one person should be cleaned on an "as needed" basis.**
 - Respirators used by two or more people should be cleaned and disinfected after each use.
- **Respirators that are used for emergencies should also be cleaned and disinfected after each use.**
 - Respirators used for training purposes need to be cleaned and disinfected after each use, as well.
- **There are hazardous substances, like lead and asbestos, that require extra cleanup procedures.**
 - Consult your supervisor if you are working with these materials.

- **When you are through cleaning your respirator:**
 - Put it in its case.
 - Store it in a clean, dry place.
 - This way it will be ready to go the next time you use it.

*** * * SUMMARY * * ***

- **Respiratory hazards exist all round us, do your part to combat them!**
- **Be aware of possible respiratory problems in your workplace.**
- **Read Material Safety Data Sheets and be on the lookout for other indications of respiratory hazards.**
- **Use ventilation equipment and environmental controls to reduce airborne contaminants.**
- **Wear respirators when necessary, and make sure you follow the OSHA and NIOSH regulations regarding selection and use of filters.**
- **Before you use a respirator, get fit-tested.**
- **Use recommended cleaning and disinfecting practices to keep your respiratory equipment in working order.**
- **When it comes to respiratory safety, always use the right "tool" for the job, to make sure that you are breathing safe, clean air... every day!**