

Respirator Usage

Mark Banister

The Occupational Safety and Health Administration (OSHA) regulates the use of respiratory protection in workplaces, including at Carnegie Mellon. If you use a respirator of any sort as part of your work activity, please read this information.

What you need to do if you use a respirator depends on three main factors:

- Whether or not you are an employee of Carnegie Mellon
- Whether you are REQUIRED to use the respirator
- What type of respirator you use

First of all, if you do not receive a paycheck from Carnegie Mellon, you do not "officially" fall under OSHA regulations. We want you to follow these steps nevertheless, to ensure your continued safety and health.

Secondly, if you are **REQUIRED** to wear a respirator as part of your job, you must do the following. 1.) Complete a medical questionnaire and have it evaluated by a physician so we can be sure you are physically able to wear a respirator. 2.) Receive Respirator Training at least annually and receive a fit test at the same time. EH&S can coordinate these activities for all campus people necessary. If you are provided a respirator to wear on a voluntary basis, you may or may not need these two items. EH&S will advise you on this.

Third, if you use a true, tight-fitting respirator in either a required or voluntary basis, you still need the Questionnaire approval and the annual training. If you use a filtering facepiece (i.e., a disposable "respirator" or dust mask) on a voluntary basis, you need only an initial orientation on the proper use of these items.

EH&S coordinates **ALL** respiratory activities at the university, even voluntary ones, so be sure we know if you are using any respirator. Please contact either Mark Banister (8-1493) or Andrew Lawson (8-8405) if you have any questions about this information or your compliance with respirator requirements.

Ergonomic Evaluations

Jim Gindlesperger



The ergonomic evaluation program offered by EH&S has become so popular that many who need service quickly may find that they often have to wait longer than they would like. One of the reasons for this is the increase in the number of repeat evaluations that are being requested. While we would like to accommodate every request, sometimes it is not practical, or even necessary.

Ergonomic principles do not change from location to location, so moving to a new office doesn't change the need to sit correctly. Once you've had an initial evaluation, instead of getting a new evaluation it is easier and faster to simply set your new office up like your old one. The same applies if you get a new keyboard, or a new chair. If you position your new office equipment the same as you had your old equipment, you will continue to be in a good ergonomic position and should have no problems.

To ensure that those with ergonomic issues can get them taken care of as quickly as possible, it has become necessary for us to adopt two changes. First, ergonomic requests can now be submitted to us electronically by going to http://ehs-alert.fms.bap.cmu.edu/Occupational_Safety/ergonomics.htm. The second change is that we can now only do two evaluations per person in a five year period unless there is a proven medical need.

For those who don't meet that criterion but still aren't sure if they are sitting properly, we recommend referring to the written report you were given at the time of your evaluation. If you still are not sure, we have placed additional information on how to set up your work area on our web site. Go to <http://www.cmu.edu/ehs> and follow the ergonomic links. Your understanding and cooperation in this area will be appreciated and will ensure that those needing assistance can continue to get it in a timely manner.

Happy New Year!



The EH&S staff would like to extend our wishes for a safe and prosperous 2007 to all students, faculty, and staff.

Emergency Information

Jim Gindlesperger



EH&S has recently begun posting emergency information at main entrance doors, and our goal is to ultimately have the postings in every building on campus. These postings provide information on how to evacuate the building, including general information as well as specific exit routes and assembly areas for that particular building. Information on what to do if you must remain in the building is also included.

Unfortunately, we have found that some of these postings have been defaced or removed. The information contained on these notices is extremely important and could save a life. We are asking that the notices be left intact and kept in the locations that have been selected. Anyone wishing personal copies of the information can obtain as many as are needed by contacting EH&S.

The Truth About Polonium 210

John Zoll



Stories about former KGB agent Alexander Litvenenko have filled the news in recent weeks. Litvenenko had been a harsh critic of Russian President Vladimir Putin, and like another Putin critic, Anna Politkovskaya, he has been murdered.

I have had many questions about this case recently, not because I am an expert in criminal justice or forensic science, but because the murder weapon in the Litvenenko case was a radionuclide, Polonium 210 (^{210}Po).

^{210}Po occurs naturally in the Earth's crust and can be found in small quantities in soil

and water and therefore, trace amounts can also be found in our bodies. But don't be alarmed, the levels in our bodies are barely measurable.

There are several commercial and scientific applications for this material. Primarily, ^{210}Po is used as a static eliminator where precise measurements of materials which might carry electrostatic charges are required, or where a manufacturing process, such as paper rolling or spinning fibers might create a charge. The static charges are eliminated when radiation, in the form of alpha particles, create ions in adjacent air. The ions, in turn neutralize the static electricity in the vicinity of the work, allowing it to continue unimpeded by static.

Outside the human body, there is virtually no ill effect from ^{210}Po , as the alpha particles are stopped by the dead skin cells that comprise the outer layer of epidermis. The adverse effects to health occur when those same alpha particles are taken internally. ^{210}Po concentrates in the kidneys, spleen, liver, and to a lesser degree, in the bone marrow. Ingestion of several micrograms (~ 10 mCi) will first imitate symptoms similar to food poisoning; nausea, diarrhea, vomiting and fatigue. Several days may pass before this first phase is followed by complete hair loss and a massive depletion of the body's white blood cells. Sloughing of the gastrointestinal lining and severe bleeding would follow. A survival time for this level of poisoning, would likely not exceed 20 days in 50 % of the populace.

Like many substances (gasoline comes readily to mind) ^{210}Po can be handled safely so that we may benefit from its properties. Just use proper precautions when handling, and don't eat it!

Using Controlled Substances for Research

Jeffrey Harris

The state and federal governments have numerous regulations pertaining to the legal purchase and use of controlled substances. University employees and other individuals are covered by this law and must comply with all applicable regulations. This is an overview of what is required:

Controlled Substance - Any substance listed in the Controlled Substances Act, Code of Federal or Substance Regulations (21 CFR, part 1300 to end). The regulations are established and enforced by the Drug Enforcement Administration. For example: barbitol and its isomers/salts.

Registration - For use of controlled substances in research, complete DEA Form 225. For use of controlled substances in teaching, complete DEA Form 224. Registrations are issued by location, and not necessarily Principal Investigator. Registrations must be renewed annually. Items are NOT grandfathered into your inventory. If you have a controlled substance you MUST register.

Purchasing and Receiving: Special forms exist; a list of approved manufacturers is required. In fact a license number must accompany any request, especially for Schedule I and II Drugs, before any materials can be shipped.

Labeling, Storing and Securing: If controlled substances are removed from their original packaging and compounded, diluted or combined, each new container must be labeled and tracked. The label must include: the name of the controlled substances, lot number, final concentration, the amount per container and the expiration date (not more than 30 days after dilution date). Items must be stored away from all other materials and in a secure area. The DEA will most likely inspect the location before registration is complete.

Use & Disposal: Outlines responsibilities of "authorized users" and includes thoroughly documenting all actions taken with the controlled substance (known as Disposition Records). Also required are documental disposal forms, certifying destruction of the material. There are important steps for reporting theft or loss of any material.

Exemptions: Exemptions exist for using controlled substances in small amounts. However, the exemption must be approved through the registration process.

Please feel free to contact EH&S for questions or concerns. This is an important rule that must not be overlooked.

Nanotechnology and Nanomaterials

Michael Fouch



If you do not know what fullerenes, quantum dots, and single walled carbon nano tubes are, you soon will. Nanomaterials are currently being used in over 200 products and more are on the way. From everything including tennis rackets to car parts and even medicines, nanoparticles are no longer science fiction, they are science fact.

The question is, "How safe are they?" The answer is a rock solid, "No one knows for sure." The definition of nanomaterials or nanoparticles is any particle that is 100 nanometers or less. A nanometer is utterly, mind bogglingly small. For comparison purposes, consider that the width of human hair is approximately 80,000 nanometers.

Nanoparticles do occur in nature, produced from fires and volcanoes, however the concern is with engineered nanoparticles. These small particles have a greater surface area for which reactions with other chemicals can occur. They can deposit themselves into the all regions of the lungs. They can affect the heart, nervous system, they can enter through the skin, and there is some evidence that they can follow the olfactory nerve and enter the brain directly. The good news is that by using current "safe practices" we can avoid exposures and protect ourselves. One of the leading manufactures of respirators has tested their products and declares them effective against nanosized particles. Gloves also appear to protect your skin against nanomaterials. The use of a properly working fume hood appears to be effective in preventing overexposure to nanomaterials.

So until more information is available, if you are working with or near nanomaterials please use your personal protective equipment, make sure you are performing the work in a properly working fume hood and if you have any questions please contact me at mfouch@andrew.cmu.edu