DATA SHEET — RESPIRATORY PROTECTION RULES

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This data sheet is designed to answer some frequently asked questions about the Occupational Safety and Health Administration's (OSHA) basic rules for respiratory protection.

DUST MASKS ARE RESPIRATORS

There is a common misconception that “toxic dusts masks” are exempt from OSHA’s rules. They are not. OSHA considers masks as simply one type of respirator and defines them (at 1910.134(b)) this way:

*Filtering face piece (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.*

The only dust masks not covered by OSHA are the cheap pollen dust masks that can be purchased at drug stores and those loose-fitting masks used in the medical profession. The labels on these types of masks clearly state that they do not provide protection against toxic substances.

EMPLOYERS MUST HAVE PROGRAMS

If you regularly wear a respirator on the job, OSHA requires your employer to provide:

- **A Written Program** explaining how your employer will meet all the requirements.
- **A Written Hazard Evaluation** to determine hazards you face on the job and the employer’s rationale for selecting particular respirators.
- **A Medical Evaluation** to determine your ability to wear the selected respirator and annual medical checks which may be done by a physician or a “licensed medical professional.”
- **Formal Fit Testing** by a qualified person using an OSHA-approved method.
- **Documented Training** to insure that you are familiar with the use and limitations of the equipment, procedures for regular cleaning, disinfecting, and maintaining all respirators, how to don, doff, and do a “seal check” before each use, and other technical matters.
- **Periodic Program Evaluation** to ensure that respirator use continues to be effective.

Let’s face it: short term employers in particular are likely not to provide all these program elements. During workplace inspections in the past, we especially saw that many employers were not providing our workers with medical certification.
WHAT IS MEDICAL CERTIFICATION?

It takes a lot of energy to breathe through filters. Workers with lung, heart, or other physical problems may worsen their health problems by wearing respirators. For this reason, OSHA requires medical certification before you wear a respirator on the job. Usually this is done through an occupational medical clinic or similar medical service.

The cost of medical certification is supposed to be borne by the employer. However, if you work for Local USA 829, we will arrange for and pay for it. (If you are self-employed, it will be costly and sometimes hard to find a qualified clinic or doctor to certify you.)

To be certified, USA 829 workers fill out a detailed, confidential health questionnaire which is transmitted directly to Mt. Sinai’s Occupational Medical Clinic. Your employer never sees this document so your medical information is private.

The questionnaire is evaluated by a medical professional who may approve you on this basis alone. However, if your questionnaire indicates you have had asthma, you smoke, have heart problems or other risk factors, you may be interviewed by the medical professional or doctor. If there are still doubts about your health, you may be called in for a medical exam.

If you wear a respirator—or plan to wear one—and are not medically certified, get in contact with the office immediately and start the process. Once you are medically certified, we can make sure employers also do their part by providing the rest of the OSHA program.

WHY IS FIT TESTING NEEDED?

You cannot know whether or not your respirator is protecting you unless you have been fit tested by a “qualified person.” Masks and respirators are designed to fit the “average” face and there are many people who will have a very hard time finding one that will pass this test. People wearing masks without passing a fit test may be exposing themselves to contaminants without knowing it.

WHO TESTS?

Your employer must provide a person qualified to do a proper fit test. (If you are self-employed, you will have to arrange your own fit testing. You can hire an industrial hygienist or consultant, or the clinic that certified you may do it.)

Some workers mistakenly think they can test themselves by doing a “fit check.”

WHAT IS A “FIT CHECK”?

Confusion between the terms “fit test” and “fit check” caused OSHA to change the term “fit check” to “user seal check.”

A “fit check” or “user seal check” is done by putting the mask on and seeing if it will briefly maintain negative pressure when you inhale, or retain positive pressure when you exhale. If it
doesn’t fit, you will feel air escaping near your nose, under your chin, or from some other place where the seal is broken.

To perform a user seal check for a cartridge respirator, you need to close the exhalation valve with your hand and exhale into the facepiece. Next you want to block air coming into the cartridges with your hands an inhale. The facepiece will not let air leak in or out on either procedure. Employers are required to provide trainers who will give workers hands-on instruction on seal check procedures. Workers are expected to do this check every time they put on a respirator or mask.

**THE REAL FIT TEST**

A “seal check” is not a “fit test.” Employers must provide real fit testing of all respirators (including masks). Your employer may hire a consultant or have an employee specially trained to do the job. The OSHA regulations describe the various approved methods for doing the two basic types of fit testing.

1. **QUALITATIVE FIT TESTING** depends on the wearer’s ability to sense an odor, taste, or irritation from one of four approved chemicals delivered in a controlled way to an enclosure around the user’s head. Chemicals approved for this use include banana oil (isoamyl alcohol), saccharine mist, an irritant smoke (stannic chloride), and a bitrex (denatonium benzoate). These tests are not allowed for full-face negative pressure and supplied air pressure demand respirators.

2. **QUANTITATIVE FIT TESTING.** This type of fit testing is done by measuring and comparing the pressure or contaminants inside and outside the mask or respirator. The equipment is expensive but the tests are applicable to all types of respirators, are more accurate, and they create a document which makes it easy for employers to keep on file the required written records.

**BEARDS**

Many men mistakenly think that they can successfully wear their respirator over a beard or facial hair stubble. They can’t. And the new OSHA rules contain very explicit wording about facial hair. Under 29 CFR 1910.134(g) Use of respirators, it says:

**(1) Facepiece seal protection. (i) The employer shall not permit respirators with tight-fitting facepieces to be worn by employees who have:**

**(A) Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function, or**

**(B) Any condition that interferes with the face-to-facepiece seal or valve function.**

In addition, in the mandatory fit testing procedures in Appendix A, Part I, it says:

**(9) The [fit] test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface...**
Employers who let their bearded workers wear respirators risk OSHA citations. And it has been established that employers can require their OSHA-covered workers to shave.

**SAVING THE BEARD**

A hooded supplied-air system will work for most workers who are determined to keep their beards. These systems are expensive and require the purchase of many compressed air cylinders or a special compressor that can produce air that is safe to breathe. Ordinary shop compressors must not be used for this purpose. They usually add carbon monoxide and/or oil mist to the air. The complete supplied-air system may cost well over $1,000.

**NEW STANDARDS FOR FILTERS**

You may have noticed that the acronym NIOSH is always on masks and respirators. This stands for the National Institute for Occupational Safety and Health. NIOSH specifies the tests that the products of all manufacturers of respirators must pass. There are NIOSH standards for both the chemical and particle filters.

In 1998, the Occupational Safety and Health Administration (OSHA) rewrote the respiratory protection standard. One of the most important changes was the adoption of new standards for some of the filters that are in masks or in respirator cartridges.

- **CHEMICAL FILTER** standards have not changed. These filters capture substances such as ammonia, formaldehyde, acid gases and organic solvents. It is crucial to know exactly what kind of chemical is in the air because the wrong cartridge will render the respirator useless. In addition, there are many chemicals for which there are no cartridges. Included are ozone, nitric acid, methyl alcohol, carbon monoxide, and many more.

- **PARTICULATE FILTERS** capture airborne solid particles such as dusts and fumes and liquid mists such as aerosol and airbrush mists. Picking the right mask used to be easy when there were only three types: dust, mist and fume. Now, there are nine different types.

- **PERFORMANCE CLASSIFICATIONS.** Particulate filters now come in three different series designated as N, R and P. All of these filters are tested against “fume-sized” particles (0.3 microns). The filters in each series have three minimum efficiency levels - 95%, 99% and 99.97%. That is:
  - N95, R95 and P95 filters are certified as having a minimum efficiency of 95%.
  - N99, R99 and P99 filters are certified as having a minimum efficiency of 99%.
  - N100, R100 and P100 filters are certified as having a minimum efficiency of 99.97%.

- **N SERIES FILTERS** can be used only in atmospheres containing non-oil-based particulates, e.g., do not use N filters if people nearby are machining metal with cutting oils, or spraying WD40.
The N filters also have a “time-use restriction.” This means you should only use them for eight hours. The eight hours can be either continuous or intermittent. Intermittent use means that you are using the filter short periods of time, sealing it in plastic Ziploc® bags between wearings, and discarding the mask when the amount of time it was used adds up to eight hours.

- **R SERIES FILTERS** can be used whether or not there is oil present. R filters also have a time-use restriction of eight hours of continuous or intermittent use.

- **P SERIES FILTERS** may be used in either a non-oil- or oil-containing atmospheres. They do not have any time-use restrictions which means they can be used until they are soiled, damaged, cause an increase in breathing stress, or show some other sign that they are worn out. The P100 is the top of the line and the only cartridge filter to be assigned the magenta color reserved for the HEPA.

**CHOOSING THE RIGHT RESPIRATOR**

To choose the right mask or cartridge respirator, you need to consider three primary factors:

1. The toxicity of the contaminant,
2. The particle size distribution of the contaminant, and
3. The concentration in the air.

**TOXICITY**

The choice is simple if you are working with highly toxic substances such as powdered pigments containing lead, cadmium or chrome. In these cases, you always use a filter with a 100% rating. For example, OSHA requires a 100% HEPA filter be used whenever lead is airborne regardless of particle size.

**PARTICLE SIZE**

Course or granular materials of moderate or low toxicity may be addressed with less a efficient filter. For example, a 95 could be used for wood and plaster dusts.

On the other hand, metal fumes, dyes and pigment powders are known to contain significant amounts of particles in the range of 0.5 microns in diameter. These require a respirator with a filter efficiency of 100. And some pigment and dye products are much smaller in size than 0.5 microns. The NIOSH theory was that these smaller particles would be attracted to the filter fiber’s static electric charge and captured on the fibers. New studies indicate that it is more likely that significant amounts of the very small particles will go through the filter.

Our problem in picking the right respirator is that many of our suppliers do not provide particle
size information on products such as dyes and pigments. Suppliers have no excuse for failing to provide this information because it is readily available from primary manufacturers. Our secondary suppliers buy in bulk and repackage this material for our use, but many do not pass the particle size data along to us. If you don’t know the particle size of the powdered materials you use, it is wise to use the material in local exhaust such as in a spray booth. If this is not possible, use the 100 filters.

Choosing whether to use an N100, R100 or P100 mask also should depend on how you work. If at the end of the day, your masks usually looks dirty and bent out of shape, you should buy the least expensive N series mask and replace it frequently. If your masks usually look as good a new at the end of the day, you will save money buying the more expensive P100’s and taking good care of them.

RISK ASSESSMENT

OSHA requires your employer to “identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazards(s)....” This usually means that air sampling or calculations of the concentration in air must be done. And this data will determine how much protection will be required. This could range from the bottom of the line N95 toxic dust mask all the way to an air-supplied hooded system. The exposure data can also be used to determine how long chemical cartridges can be used before they must be changed.

Often we find that employers tell our workers to pick out the right respirator and cartridge themselves. Under the OSHA regulations, it should be employers who assess the hazards and assign the respirator. But should you be faced with picking out the right equipment and you are not sure which is best, call me. I’ll help.

MULTIPLE CARTRIDGES

Sometimes cartridges are needed which can protect the wearer from two or more contaminants. A common example is a respirator used for solvent-containing paint spray mists. For these jobs, a particle pre-filter is needed to stop the mist particles and an organic vapor cartridge is needed underneath to collect the solvent vapors that are released when the mist dries on the filter. Some paint spray filters are units made of these two elements combined in a single cartridge.

Other combinations might include a cartridge for both solvents and acid gases to use during photo-developing, or for both wood dust and solvents in a shop where woodworking and painting are both being done.

VOLUNTARY USE EXEMPTIONS

Sometimes employers say that workers can wear respirators if they want to or not–that the hazards are not great enough to warrant a full program including medical certification and fit testing. These employers are referring to section 1910.134(c)(2) which provides an exemption from some of the OSHA requirements if respiratory protection is not really needed but employers want to give workers the option of wearing them.
However, to qualify for this exemption, the employer must prove that the contaminants are well below any action limit or PEL for the contaminant. This is usually done by performing personal monitoring of workers doing “typical” work. Unfortunately, there is very little “typical” theater and film work and most work is non-routine and hard to assess. For this reason, I rarely recommend employers use this exemption.

Assuming, however, that the employer has proven that the worker would be safe without a respirator,.134(c)(2)(i) says:

(i) An employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard. If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in Appendix D to this section ("Information for Employees Using Respirators When Not Required Under the Standard");

I have underlined two important provisions in this rule. A common example of a violation of this rule is when masks and respirators are left lying about. Leaving masks out where they will be worn dusty and dirty and possibly be shared is a potential hazard. In fact, Appendix D—which employers are required to give their voluntary users—addresses shared use specifically:

4. Keep track of your respirator so that you do not mistakenly use someone else’s respirator.

Another common way in which voluntary use may put the wearer in jeopardy is when individuals with asthma or other serious respiratory problems attempt to protect themselves without knowing that breathing stress can exacerbate their condition.

In summary, employers can’t even let workers wear respirators voluntarily on their premises unless they:

- have documented that exposures will be below action levels or OSHA permissible exposure limits;
- have a program insuring that neither use nor misuse of respirators will put workers at risk; and
- provide training in the form of the information in Appendix D of 29 CFR 1910.134 of the OSHA regulations.

ISN’T THIS OVER-KILL?

How could anyone possibly be harmed when wearing a respirator? Isn’t this an exaggerated fear? Actually, a survey of Occupational Safety and Health Administration (OSHA) investigation reports from 1984 to 1995[1] found 45 deaths due to asphyxiation or chemical poisoning while wearing
respirators. Twenty-three deaths were related to misuse of air-line respirators, 17 deaths involved use of air-purifying respirators, and 5 deaths involved self-contained (air tank) breathing apparatus. Most of the deaths involved procedural violations. For example, three of the workers who died had beards and wore tight-fitting respirators in an atmosphere that was immediately dangerous to life and health.

**WHAT DO I DO IF I JUST CAN’T FIGURE ALL THIS OUT!!**

Call your Health and Safety Officer, Monona Rossol, or your respirator manufacturer for specific information on specific jobs. Have the product’s material safety data sheet (MSDS) available and any other relevant data when you call for advice.


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