

TerranearPMC Safety Share

Week of August 29, 2016– Disposable Dust Masks

Every so often, I am confronted with the topic of disposable respirators - or more aptly put – disposable filtering face pieces. Many times, workers are performing a task where airborne particulate or dust is generated. Even if the particulate material is not considered a toxic substance, an exposure assessment, still needs to be performed. This generally means conducting an industrial hygiene survey with a real-time dust monitor to determine particulate concentrations. Both OSHA and the American Conference of Industrial Hygienists (ACGIH) have established occupational exposure limits for non-toxic particulate. After all, our respiratory system is a very sensitive apparatus made of delicate tissue, often times containing membrane that have a sheerness of merely 0.1 microns; this is the typical thickness of the alveoli tissue – the air exchange sacs in the deepest reaches of the lung where oxygen and carbon dioxide (CO₂) enter and leave the blood stream. Obviously, any foreign object, such as a dust particle, may cause damage should it reach these crucial regions of the lungs; even if the particles are not considered toxic!

As a result, it is not uncommon for people to want to protect themselves from inhaling such benign material. Because dust masks are easily assessable (one can purchase these items at stores such as Walmart or Home Depot), inexpensive, and are easy to purchase without going through an extensive requisition process, dust masks have become a quick solution when employees want remove the irritation associated with non-toxic dust. But, do such devices really provide any protection? OSHA addresses such devices in the Appendix D section of their regulation for respiratory protection program, 29 CFR 1910.134, *Information for Employees Using Respirators When Not Required Under the Standard*. This standard states that:

“...Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.”

Therefore, even if workers would like to protect themselves when a contaminant is less than the Occupational Exposure Limit (PEL, TLV), respiratory protection can be worn PROVIDED your organization allows for such use (This would be specified in your company’s written respiratory protection plan). And, while dust masks (or filtering face pieces) are defined (per OSHA) as a negative pressure particulate respirator, as well as being assigned a protection factor comparable to a more-traditional elastomeric type, if the basic requirements for respirator use are not met, such units will not provide any protection from airborne particulate from being inhaled and quite possibly being deposited in those crucial regions of the lungs where oxygen/CO₂ gas exchanges occur.

OSHA’s basic requirements for wearing a respirator include, training for use, proper care/maintenance, limitations of the respirator, being fit-tested (ensuring the particular respirator you are wearing will protect you from the specific contaminants-of-concern) as well being medically qualified to wear a respirator. This last measure is necessary as, in general, respirators



TerranearPMC Safety Share

increase breathing resistance and therefore, through a medical evaluation, it must be determined if one has the proper lung capacity to work under such conditions.

All this for just wanting to keep dust out of your nose and mouth!? Keep in mind that modern dust masks that have been NIOSH-approved (and therefore recognized by OSHA as being appropriate respiratory protection) are manufactured with specific filtering media which have been assigned an alpha-numeric category, such as N95 and P100. Without going into detailed minutiae, these categories specify the type of particulate (based on oiliness) and the efficiency (for instance, a type 100 filter is equivalent to a HEPA filter with an efficiency of 99.97% for particulate with a mean aerodynamic diameter of 0.3 microns). Therefore, respirators that have an air purifying media that has been assigned a NIOSH efficiency, will cause a certain amount of breathing resistance that may impact a person's health if they have a diminished lung capacity (remember that respirator filters are "trapping" very small material particulate and so it stands to reason that it would be harder to breathe with these masks covering one's mouth).

Yet, there are dust masks that do not have alpha-numeric ratings. Such units are not recognized by OSHA as offering any type of protection. One can typically purchase these masks in a package of 10-20 for a very nominal cost (a few dollars). But will they truly offer adequate protection from airborne particulate; even when the airborne particulate is not toxic and considered only as a nuisance? Well, according to subject-matter experts, such dust masks (that do not have a NIOSH efficiency rating) have not been evaluated for their filtering ability. And that includes the typical surgical masks. Because these masks lack the ability to be evaluated for an appropriate fit test, experts agree that persons would really breathe in air that would bypass the filter by taking the "path of least resistance," causing persons to inhale air that goes around the mask and therefore, would not be filtered at all. Thus, they do not effectively filter small particles from air and do not prevent leakage around the edge of the mask when the user inhales. Such units often have only one head strap. So bottom line, these masks are not intended for use when a respirator needs to be worn.

Respirator protection professionals have the obligation to inform workers that, if one uses a non-rated dust mask or uses a NIOSH-approved filtering face piece without being fit tested, that wearing such articles would not serve any other purpose than to give a person a false sense of security. Should exposure assessment methods verify that an airborne material is non-toxic or that the particle concentrations are within occupational exposure limits, then workers may, in fact, use such devices without causing harm to themselves. However, because an assigned protection factor would not be applicable, respirator professionals would be hard pressed to state that persons wearing these devices would be receiving any health benefits at all.

You may not control all the events that happen to you, but you can decide not to be reduced by them - Maya Angelou

