

Pocket Respirators a Survival Essential

By James C. Jones, EMT/CHCM, former industrial safety manager

The image of the “survivalist” wearing a military, full-face gas mask and protective suit is repeatedly used on the cover of survival magazines and books. These military “gas masks” and their industrial equivalents are designed to be used by trained military personnel and first responders for entry into and prolonged operations in a hazardous atmosphere. In most cases a civilian “survivalist” will not knowingly enter an area or building that is contaminated by chemical agents, biological hazards or radiation (fallout dust). The civilian is most likely to be caught in an unexpected exposure that is of a limited area and/or time frame. The civilian’s priority is to have immediate and effective protection long enough to perform limited survival tasks such as rescue or gathering supplies and to evacuate to a location where safe breathable air is available. In this case (as always) it is not what you have, but what you have with you that will count. While military and industrial masks are bulky, expensive, vision limiting and most importantly: unlikely to be with you when you need them, while smaller “dust/mist” respirators are handy, easy-to-use and effective enough for short term tasks and escape. A few of these in your pocket, purse, glove compartment and survival kits will be far more valuable than that military M-17 or Israeli M-15 in your closet at home. I recommend that you have at least one fold-flat N-95 respirator in the pocket of every jacket, a few in your glove compartment, one or two in your bedside drawer and 4 to 6 in your survival pack. In many emergency situations poisoned air is not the most immediate issue, but when it is it could kill you faster than lack of water, cold, lack of food, or even severe bleeding. The most probable sources of respiratory harm in a disaster are dust, soot and vapors. NIOSH / MSA approved, N-95 “dust/mist respirators are available in hardware stores for use in paint spraying and dust generating construction work. These masks are usually priced at about \$1.50 but can be purchased on line for about \$20.00 for a box of 20.

Airborne biological agent can be in the form of dust such as anthrax, aerosol vapors deliberately emitted by terrorists or carried in the air from the breath of infected populations. If you frequently use public transportation or are often in or near events with large crowds that could be targeted for release of a biological agent, that mask in your pocket could save your life. Low intensity epidemics where people still need to go to jobs and perform basic tasks in public will require the wearing of basic, well-fitted N-95 masks on a daily basis. I can tell you from my industrial experience with the swine-flu scare that these masks will be sold out at the first clue of an epidemic. I bought hundreds for my employes way ahead of time. I highly recommend stocking at least 10 for each family member in stock at home.

Chemical hazards can be contained within smoke and dust from fires and explosions or generated by deliberate or accidental emissions. While such incidents can be lethal to those in the immediate or downwind area they can be escaped from by those who have immediate protection. Hence the pockets and bedside drawer recommendation.

Types of Masks

While the term “N-95” generally is used to describe the most common dust/mist masks it actually refers to the materials used and can apply to other types of partial and full-face mask filters. The rating of N-95 does mean that it will filter out at least 95-percent of mists and dust particulates based on NIOSH “worst case” testing. The “N” indicates that the mask is not oil resistant and will be less effective if exposed to oily mists. The N-95 should be adequate for virtually all particulate, soot, mist and biological hazards. There are respirators rated at N-99 and N-100, but these are a bit more expensive and will be harder to breathe through. The N-95 is not designed to filter out any chemical hazards or gases, but is better than nothing in all cases. N-95 respirators with an added layer of charcoal impregnated material offer limited protection against many chemical agents such as ammonia, chlorine, and hydrogen sulfide, but it must be remembered that many such chemicals also affect the eyes and skin. If you truly can anticipate exposure to a hazardous chemical gas or vapor, consider this upgrade. Charcoal impregnated masks usually sell for about \$4.00 each or \$35.00 for a case of ten. These are rated as protection against “nuisance chemicals” and are not a substitute for full face full-filter masks for extended exposures.

. Respirators come in variety of styles and options. You can get them with a breathing valve that permits exhalation to go out through the valve instead of around the face seal. While the rounded mask can be flattened to go into the pocket, you can get soft, flat folded masks that are more convenient to carry. The masks that come with two straps and a pliable metal strip to fit over the nose make the best fit. Masks that have a drinking port are also available. These would be good for situations where extended use in high temperatures is required

No filtration mask (even military masks) will protect you in an IDLH atmosphere. This term refers to a point where the atmosphere is “Immediately **D**angerous to **L**ife and **H**ealth” When a fire has eaten up all of the oxygen or oxygen has been depleted or replaced by carbon monoxide a filter mask will not save you. Burning buildings, pits, tanks and confined spaces where the oxygen has been depleted or replaced cannot be entered without full air supply breathing apparatus. Filter masks of any kind are intended for temporary survival and escape only.

Mask Usage

Respirators are useless if they are not donned immediately and used properly.

- Always keep your masks in dust proof bags. I use plastic sandwich bags. There is not much point in wearing a mask that is already contaminated on the inside.
- Never reuse a mask. It will be contaminated as you take it off.
- Avoid having heavy facial hair as it will probably permit contaminants to enter around the face-to-mask edges.
- Follow the instructions for fitting the mask carefully. Air and contaminants will enter around the mask instead of through the filter if they can. You will then have the illusion of protection but not the true protection.

- Wash or wipe off your face and the outside of the mask before taking it off or changing to a new mask to avoid contamination.

One more survival use for respirators that is often overlooked is protection of the lungs and respiratory tract from extremely cold air. Respiration is a major contributor to heat loss, energy depletion and hypothermia under cold conditions. Use of a respirator can significantly help to maintain body warmth in such situations.

Proper mask fitting steps illustrated below

What is often referred to as a “fit test” * is actually a “seal check” Seal fit and check steps are as follows.

1. Cup the respirator in your hand and place on your face with the bands behind the head as shown
2. Adjust the band above the ears and then the one on the neck to a tight fit.
3. Use your fingertips to form the nosepiece to fit the bridge of the nose
4. Place both hands over the entire respirator and inhale sharply. Negative pressure should be felt inside the respirator. If air leaks in around the nose or sides adjust the nosepiece and/or straps and try again. Do not enter a contaminated area until you are sure that you have a good seal.



* Fit testing is a required OSHA test involving smoke or scents and is performed by technicians.



Left column, top to bottom: flat folding mask with exhalation valve on the side. Flat Air-Aid™ mask with charcoal impregnation available from Trillon Aviation LLC of Alpine UT*. Flat N-95 cloth mask from AD Safety.

Right column top to bottom: standard N-95 mask fitted with drinking port to sustain hydration without removal of mask. Basic N-95 mask used extensively in industry and available at hardware stores and on line. N-95 mask with charcoal impregnated outer layer and exhalation valve. This mask also has an excellent fitting strip above the nose and a seal pad to assure a good fit.



Cheap single strap masks like the one above are not suitable for effective respiratory protection

Conclusion

Considering that breathable, safe air is the prime essential for life, having basic respiratory protection at hand must be a survival priority. Fortunately effective, low-cost and easy to carry mask are available. Stocking up on quality N-95 respirators and distributing them to your pockets, carry items and vehicle is a wise precaution.

** This product is rather new, but it is easy to carry in the pocket and has good filtration properties for about \$3.00 each. Contact Trillon Air Aviation, LLC, 1104 E. Alpine Dr. Alpine UT, 840 for distributors or wholesale pricing*