

What Respirator for Health Care Protection?

Alan Hack

IOM Committee on PPE for Healthcare Workers

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Filtering facepiece

Elastomeric facepiece

**Powered Air Purifying
(Loose Fitting Facepiece)**

Filtering Facepiece w/o exhalation valve



Filtering Facepiece with exhalation valve



Elastomeric Half Mask



Powered Air Purifying Respirator



Limitations

Or

What's wrong with respirators?

Almost no one likes to wear them because they are

- **Uncomfortable**
- **Require fitting**
- **Can be hot (especially if no exhalation valve)**
- **Have breathing resistance**

Comparison of Different Respirators

Requirements	Filtering Facepiece	Elastomeric Facepiece HM	Powered Respirator Loose fitting FP
Fitting Required	Yes	Yes	No
Glasses	Yes	Yes	Yes
Facial Hair	No	No	Yes
Protection	Low	Low	High
Weight	Low	Moderate	Moderate

Comparison of Different Respirators

Requirements	Filtering Facepiece	Elastomeric Facepiece	Powered Respirator
Breathing Resistance	Moderate	Moderate	Low
Visibility	Good	Good	Good
Noise	Nil	Nil	Yes
Reuse	No	Yes	Yes
Initial Cost	Low	Medium	High

Special Considerations for Health Care Settings

Does not present a frightening image to the patient

Wearer can speak to and hear patient easily

**Compatible with medical environment, stethoscope,
telephone, surgeon's head lamp, patient monitoring,
defibrillator, flammable anesthetics (intrinsic safety)**

Can filter exhaled air when necessary

Your bird flu protection kit

Reusable, long-lasting and always at hand



Your 18-month kit contains:

- Silicone respirator  x1
- Particle filter  x1
- Pre-filter (change weekly)  x80
- Pre-filter holder  x1
- Leakage test disc  x1
- Instruction manual  x1
- ID tag  x1
- Disinfection tub & storage box  x1



Optional extras:

Handy readiness pouch



Speak with your mask on



Main features:

- Silicone respirator, designed to last for years
- Non-allergenic material
- Superior face seal means a very high protection factor
- High-efficiency particle filter. Each filter tested for 99.997% absorption capacity for very small particles such as bacteria and viruses
- Pre-filter for coarse particles
- Australian/NZ Standards and NIOSH approved
- Easily fit tested and fit checked
- A single respirator and filter can be disinfected and reused over and over again (tested to withstand the equivalent of 4 disinfections a day for 18 months)
- Very simple disinfection procedure

PAPR w/Loose Fitting Facepiece (LFF)



Definition of Loose-Fitting Facepiece

A respiratory inlet covering that is designed to form a partial seal with the face

Does not cover the neck and shoulders

May or may not offer head protection against impact and penetration



**Both OSHA and ANSI Z88.2 recognize the
Loose Fitting Facepiece (LFF) category**

NIOSH does not recognize LFF at all

**Is respirator design being held back
by the existing regulations?**

**The Assigned Protection Factor (APF)
granted to PAPR equipped with LFF by
NIOSH, OSHA, and ANSI Z88.2**

is only 25

**During testing many PAPR with Loose
Fitting Facepieces provided
high protection levels**

A few designs performed poorly

There were several causes including

**wide gaps between the face and
facepiece**

**and poor retention on the head during
movement**

All these problems can be fixed

Thus all PAPR with LFF were classed as inferior because of the poor performance of a few models

This entire class of facepieces, perhaps the best for health care use, was condemned to secondary status by a quirk of the regulations

OSHA has provided a partial solution for hoods and helmets only

“The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000... . Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.”

1910.134(d)(3)(i)(A)

However OSHA will not accept testing data allowing any LFF to provide protection higher than 25

I think that this is a mistake and should be fixed

**There is a need to update
both NIOSH and OSHA regulations
referring to LFF**

**To be certified all PAPR equipped with
LFF should provide protection of at
least 1000**

**Note that higher protection level have
been suggested in proposed respirator
CBRN regulations**

Another question

How much air flow is needed?

**The historical value of 170 LPM (6 ft³/min)
Comes from the PHS work of Bloomfield and
Greenburg work in the 1920s.**

Is this still correct?

**Let's find out what air flow is required in actual
tests to achieve a protection of 1000, or
higher, and supply the breathing needs of
the wearer?**

NIOSH proposed new requirements

A low power or low air flow warning

Multiple Power Sources

rechargeable batteries

primary batteries

line power

Retain <80 dB noise level

Future design

Facepiece should be easy to clean, disinfect, or have biocide coated surfaces, or be cheap enough to be tossed

Quiet Blower, <60 dB, no moving parts

Multiple Power Sources

vehicle power, 12V

breathing air line

air motor

methanol fuel cell

