Florida Conference of Seventh-day Adventists
Florida Conference Brigade, Medical Cadet Corps
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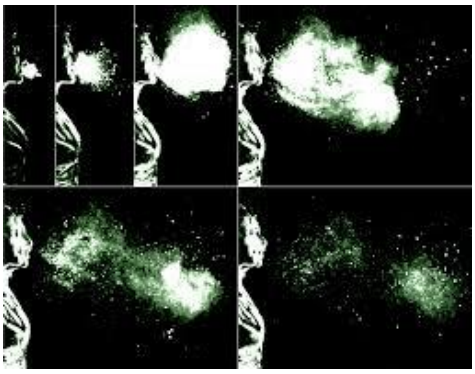
Masks Part 1: Wearing & Types

Context

Covid-19 caused a lot of material shortages and mask wearing became a much more normal phenomenon. However, mask wearing has been practiced generally for a lot longer than just the recent pandemic.



Wearing a mask generally is to protect others from you. When you visit a doctor's office and put on a mask, generally it is because you are sick or at least assumed to be sick and your spittle could cause others to become sick as well. Therefore, you put on a mask to keep your airspace to yourself and away from people. The picture is of a person sneezing is an illustration of just how far spittle travels. In reality, a general rule of thumb measurement is 6 feet, because most of the heaviest particles fall out of the air over the course of that distance.

However, in high risk situations people wear masks to protect themselves from others, though the effectiveness of masks again is primarily to keep germs from going out rather than germs coming in. Immunocompromised people, allergy sufferers, and workers with volatile materials wear masks for protection in addition to medical or laboratory workers. Technically, the picture of the cowboy using a bandana over his face to protect himself from the dust being kicked up from the dirt by the herd of cattle would be an example of a person wearing a face mask of the bandana type.

Mask Effectiveness

Regardless of the type of mask, it must fit to be effective. This includes that the mask must not gap, as in it must be snug against your face to create a contained air space. Use medical fabric tape (which is specifically designed to allow the skin to breathe unlike most other common tapes) to ensure that there are no instances of gapping. The point of a mask is to force the air to pass through the filter. If there is gapping, then it defeats its purpose.

Furthermore, if a mask does not fit properly, it usually is uncomfortable and then involves constant adjustment. This is very detrimental as one of the biggest proponents of wearing a mask is solely to avoid touching the points of entry for a disease, being the mouth and nose. Those in the medical field are trained to not touch their face with their hands in particular.

For a situation such as posed at the Covid-19 pandemic, the recommendation for adequate protection of medical workers was to wear N95s, and then if those were not available, the level of protection stepped down to surgical grade and then homemade. Due to shortages of medical supplies, expired masks were authorized for use in addition to relegations of saving medical grade N95 masks specifically for those in contact with Covid-19 patients.

However, there are many other types of masks that are employed in situations other than medical related situations. Different masks are made accordingly for various professions, which include filter grades for P100 for oils, organic gas specific filtration levels, to the heavy duty gas masks used by the military. Another option for some masks is an exhaust valve(s), which is designed to open when the wearer exhales but is pulled back to seal shut when the wearer inhales. For situations such as Covid-19 and other medical purposes where masks are supposed to keep spittle from going out, these masks were not recommended for use. However, in hard work situations having an exhaust valve or two is a safety protection which allows the wearer to breathe more easily.

Vogg Mask

Getting Used to Wearing Masks

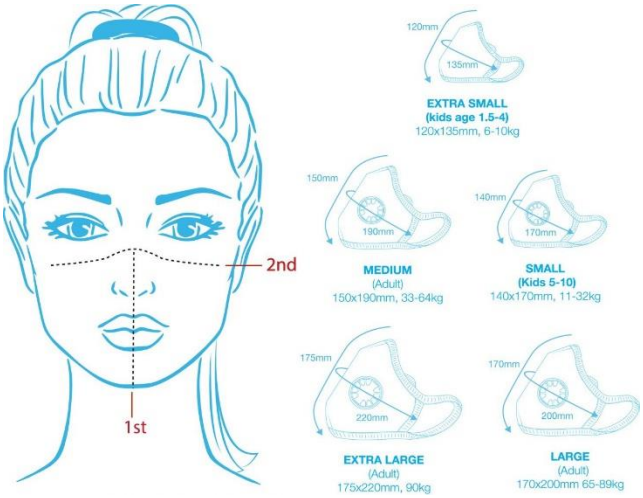
One point of difficulty includes having the elastic on ears, as is pictured in the sizing mask situation. To alleviate this problem, tying the ear loops back and securing the mask around the entire head can alleviate pressure. The rudimentary example for achieving this could simply entail taking two strings, tie one end of each string around one respective ear loop, and tie the two strings together on the back of your head. Another less bulky option would be to use snaps to attach a strap around the ear loops and then a sliding size adjustment buckle to tighten the strap down to size or using a plastic cord cinch lock/clasp to comfortably adjust the tightness as needed (no tying involved). There are some 3D printer patterns for plastic ear adjustments for the same purpose of relieving strain on the ears and distributing the pressure to around the entire head.

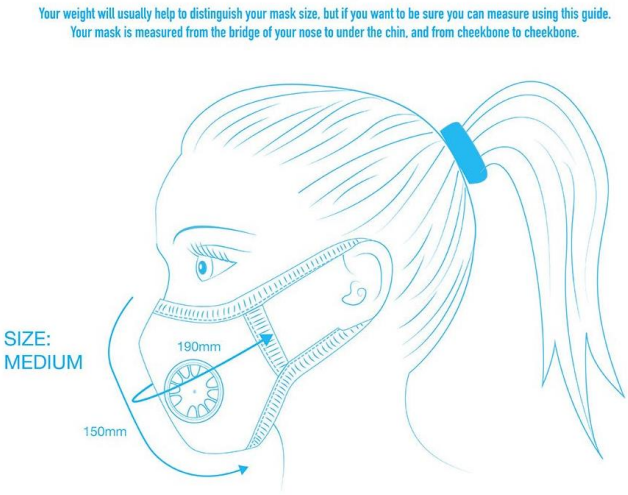
For those that are not used to wearing a mask, the larger difficulty to overcome is getting used to the temperature and being able to pull enough air to get through the mask. Depending on the filter grade and the fit of the mask (particularly if it is a half face mask or a full face mask), training oneself to be able to comfortably wear it is recommended. Starting in a comfortable, airconditioned environment while sitting down and then just holding the mask to the face to allow for easy release is the first step. Then over time increase the amount of time for wearing it and the level of physical activity and exertion. In this way, fainting episodes and other issues can be avoided.

Moldex Half Face Mask

Sizing Masks

To size a mask, taking some facial measurements is recommended. Below are some depictions for a mask sizing guide which illustrates two primary axes for sizing masks (Cambridge Masks). Depending on the model and type of mask to be worn, different measurements may be necessary but following the manufacturer's sizing guide is recommended. Then checking the fit in person to avoid gapping once the mask has arrived can be used to confirm the fit.





Materials & Filtration Ratings

Different mask materials allow for different grades of filtration and depending on the desired object to filter and item availability can determine what type of mask to wear in what situation. Effectiveness of filtration is difficult to gauge with homemade masks as they are not standardized. However, the following table is from an academic study for material effectiveness of filtration against two different types of bacteria. Higher percent filtration efficiency is desired and is considered to be more effective.

Material	*B atrophaeus*		Bacteriophage MS2		Pressure Drop Across Fabric	
	Mean % Filtration Efficiency	SD	Mean % Filtration Efficiency	SD	Mean	SD
100% cotton T-shirt	69.42 (70.66)	10.53 (6.83)	50.85	16.81	4.29 (5.13)	0.07 (0.57)
Scarf	62.30	4.44	48.87	19.77	4.36	0.19
Tea towel	83.24 (96.71)	7.81 (8.73)	72.46	22.60	7.23 (12.10)	0.96 (0.17)
Pillowcase	61.28 (62.38)	4.91 (8.73)	57.13	10.55	3.88 (5.50)	0.03 (0.26)
Antimicrobial Pillowcase	65.62	7.64	68.90	7.44	6.11	0.35
Surgical mask	96.35	0.68	89.52	2.65	5.23	0.15
Vacuum cleaner bag	94.35	0.74	85.95	1.55	10.18	0.32
Cotton mix	74.60	11.17	70.24	0.08	6.18	0.48
Linen	60.00	11.18	61.67	2.41	4.50	0.19
Silk	58.00	2.75	54.32	29.49	4.57	0.31

[a] Numbers in parentheses refer to the results from 2 layers of fabric.

Table pulled from Davies et al. (2013; https://www.researchgate.net/publication/258525804_Testing_the_Efficacy_of_Homemade_Masks_Would_They_Protect_in_an_Influenza_Pandemic/figures?lo=1).

For commercially made masks, standardization and tested verification of filtration effectiveness is a benefit. The table on the right is an example of some of the types of filters for a Moldex half mask and some the types of filtration options for targeted chemicals.

REPLACEMENT CARTRIDGES		
Hazard ①	**Model #**	**Approval**
Organic Vapor	8100	TC-23C-1223
Acid Gases	8200	TC-23C-1224
Organic Vapors/ Acid Gases	8300	TC-23C-1225
Ammonia/ Methylamine	8400	TC-23C-1369
Formaldehyde③	8500	TC-23C-1409
Multi Gas/Vapor ③ Smart® Cartridge	8600	TC-23C-1809
P100 Particulates	8990	TC-84A-1443

① Refer to NIOSH label for approval limitations.
② Can be used with 8940, 8910, 8970, and 8755.
③ OSHA regulations require gas-proof goggles, when used against Formaldehyde
④ Can be used with all gas/vapor cartridges.
⑤ Nuisance OV (less than OSHA PEL).

Another common type of filter classification is 95, 99, and 100 percent filter grades. The following website link provides more detail but the 100 percent filter grade provides a HEPA standard level of filtration while the 95 and 99 have a lower OSHA level. Furthermore, these numbers are often following either an N, R, or P classification, which is for determining protection levels against oil. N is for "**N**ot resistant" to oil, R is for "somewhat **R**esistant", and P is for "strongly resistant to oil" or *almost* "**P**roof".

Link for 95 vs. 99 vs. 100: https://www.moldex.com/resources/technical-briefs/when-to-use-a-95-99-or-100-filter/

Resources

For more information on different styles of homemade masks and filtration effectiveness check out this video by Sewstein: https://youtu.be/DZBbkn-g-vE

For pictures of Arlington Cemetery wearing masks, check out the following.
https://m.facebook.com/story.php?story_fbid=10159566940378976&id=198366988975&sfnsn=mo

Bible Verses

Job 17:1

Job 24:3-4

Job 41:16

Ephesians 6:10-18

Revelation 9:2

Revelation 16:17

Masks Part 1: Wearing & Types

For course certification, the form must be filled out.

Member Name (Print) _____ Instructor Name (Print) _____

Member Position Number _____ Instructor Position Number _____

Member FEMA SID _____ Instructor FEMA SID_____

Date of Instruction _____

_____ Review the context for mask wearing and purpose.

_____ Understand how to maximize mask effectiveness.

_____ Demonstrate the process for fitting masks and getting used to wearing them.

_____ Define the different types of masks based on materials and intention of filtration.

_____ Explore Bible verses on air and breath.

With a complete sheet of initials, the instructor's signature signifies certification of completion for the Masks Part 1: Wearing & Types course.

Instructor Signature _____