

Personal Protective Equipment (PPE): 'Modified N95 Mask' and 'Anti viral and anti microbial gloves'

Expected Outcomes:

N95 Mask: Medical N95 masks are a specialized respirators mask that consists of multiple layers of fabrics. These mask filter out 95% of particles whose size are above 0.3 microns. In the market, these N95 masks are available in different shapes. The proposed mask will be the first of its kind which shall have additional filters and fabric layers with better-sterilized air inhalation. It is expected to play a crucial role in COVID 19 management. The mask shall be designed in such a way that it shall be more compatible with persons suffering from COPD and for a long time wearing.

Antiviral and antimicrobial gloves: In healthcare-associated infections, the spreading of organisms by the means of gloves is recognized as one of the key vectors for pathogenesis. In the healthcare sector gloves are commonly used to prevent the health care workers from coming in direct contact with the pathogenic organisms. But in recent times it was found that these personal protection gloves are becoming a common source of spreading the pathogenic organisms from one location to another. To overcome this problem a combination of mixtures will be coated on the exterior surface of the nitrile gloves. The mixture has antimicrobial, antiviral activity. This coating can serve as the preventive measure in controlling the transmission of COVID 19. The coated gloves will be able to fully eradicate pathogenic bacterial and viral strains. The integrity and finishing of the gloves will not be adversely affected by the coating. These single used coated gloves can provide an additional means of defense against the horizontal transmission of common hospital pathogens and play a vital role in controlling COVID 19. In addition, the coatings may also be used for other PPE.

Expected Timeline : Timeline: 4- 6 months

Remarks : Funding requirement - Rs. 06 Lakh

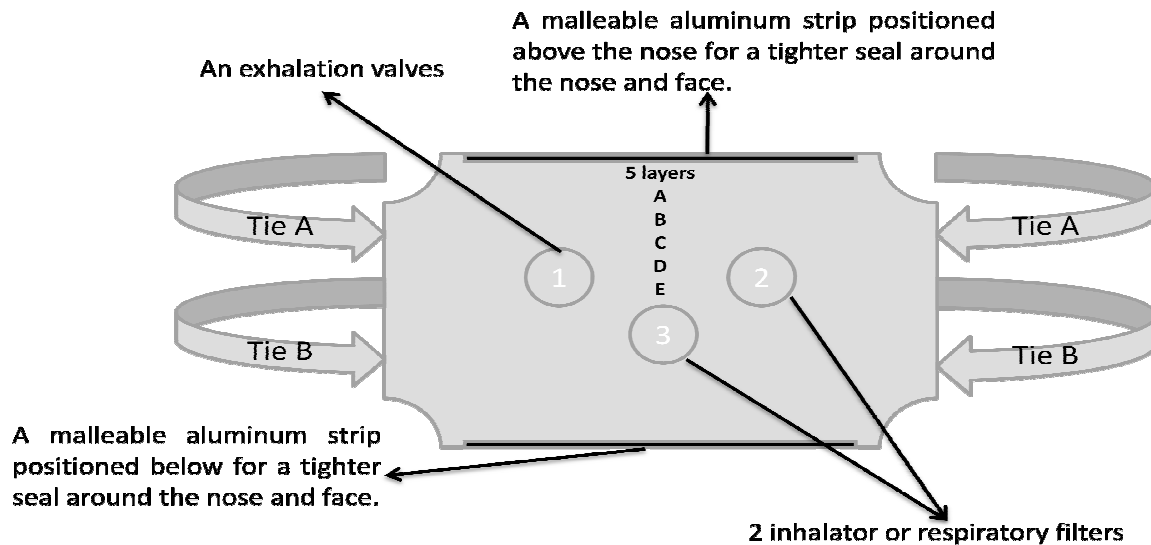
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Modified N95 Mask: a life saver

Abstract

Medical N95 masks are a specialized respirators mask that consists of multiple layers of fabrics. These mask filter out 95% of particles whose size are above 0.3 microns. In market these N95 mask are available in different shapes. Several N95s mask has exhalation valves, which help to breathe more easily. In recent time these masks play a vital role for healthcare workers working against COVID 19 patients. This designed N95 mask will consists of 5 layers, an outer layer of non-woven polypropylene fibre, a second layer of cellulose/polyester which layer is treated with copper and zinc ions., a third layer of coffee filter followed by the fourth layer of cellulose filter material and in the last a fifth (inner) layer of spun-bound polypropylene. An exhalation valves and 2 inhalator or respiratory filters (0.22 microns) will also fit in the mask. A malleable aluminium/copper strip positioned above the nose for a tighter seal around the nose and face. This mask will be the first of its kind which has such filters and fabrics layers arrangement in the market and will play a crucial role and COVID 19 management and . The mask is proposed to be more suited for the COPD persons and for long time wearing.

A sketch diagram



- A. An outer layer of non-woven polypropylene fiber,
- B. A second layer of cellulose/polyester,
- C. A third layer coffee filter.
- D. Fourth layer of cellulose filter material and
- E. A fifth (inner) layer of spun-bound polypropylene.

An exhalation valves (1) and 2 inhalator or respiratory filters(2&3) were fit in the mask

Key Characteristic features:

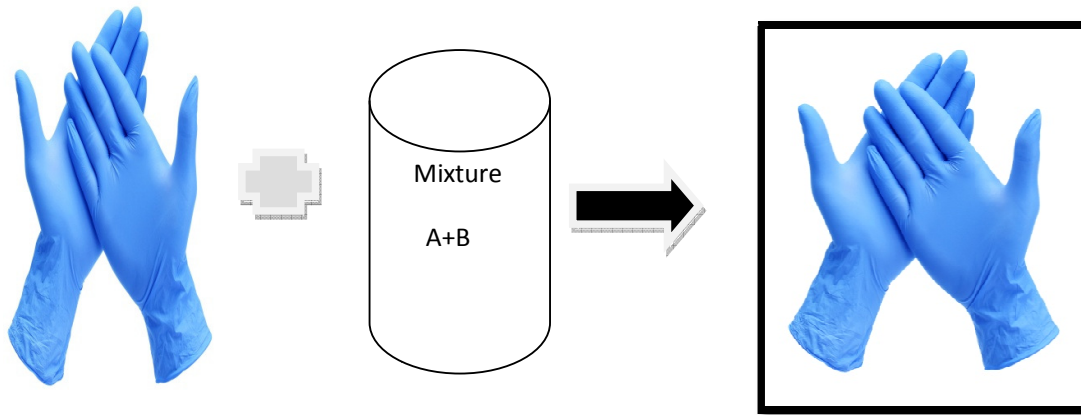
- 1) Use filter of 0.22 micron
- 2) Mask has an exhalation valves and 2 inhalator or respiratory filters.
- 3) This mask has five layers of different fabrics.
- 4) Has an coffee filter
- 5) Tie may be made of rubber/ cloth strip
- 6) Two tie will provide more holding capacity and less pressure on ears.

Anti viral and anti microbial gloves

Abstract

In health care-associated infections, spreading of organisms by the means of gloves is recognized as one of the key vector for pathogenesis. In healthcare sector gloves is commonly used to prevent the health care workers coming in direct contact with the pathogenic organisms. But in recent times it was found that this personal protection gloves are becoming common source of spreading the pathogenic organisms from one location to another. To overcome this problem a combination of mixtures will be coated on the exterior surface of the nitrile gloves. The mixture has antimicrobial, anti viral activity. This coating can serve as the preventive measure in controlling the transmission of COVID 19. The coated gloves will be able to fully eradicate pathogenic bacterial and viral strains. The integrity and finishing of the gloves will not be adversely affected by the coating. These single used coated gloves can provide an additional means of defence against the horizontal transmission of common hospital pathogens and play a vital role in controlling COVID 19.

A sketch diagram



Nitrile Gloves + coating and latex mixture = Coated nitrile gloves

Where,

Mixture A contains Polyvinyl acetate and gelatine as latex, and
Mixture B contains anti microbial and anti viral composition

Key Characteristic features:

- 1) Polyvinyl acetate and gelatine will be used as latex along with the mixture
- 2) Disposable nitrile gloves will be used to make it cost effective.