

# DEVELOPMENT OF A THEORETICAL MODEL TO PREDICT FILTRATION EFFICIENCY OF ELECTRET BASED MASKS

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In this study, a 2-Dimensional computational model to predict the filtration efficiency of the electret layer of N95 facemask was developed. The fiber packing density, fiber diameter and fiber layer thickness were included as the parameters defining the fiber structure for the model. Random 2-Dimensional fiber structure were designed using MATLAB and AUTOCAD software while COMSOL Multiphysics was used to simulate filtration mechanisms. The developed model was used to study the filtration mechanisms behavior with various surface charge densities and fiber packing densities. Also, the effect of sticking probabilities with the electrostatic and mechanical filtration were observed.

**Keywords:** Electret, Electrostatic Filtration, Surface charge