

# Filtration Efficiency, Pressure Drop and Total Inward Leakage in Anti-Yellow Sand Masks, Quarantine Masks, Medical Masks, General Masks

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Particulate respirators have been used in general environment as well as workplace. There are no strict regulations for masks used by citizens worldwide. The purposes of this study were to evaluate the penetration (PE) and pressure drop (PD) of various masks used by citizens using EU protocol and NIOSH protocol. We also evaluate the total inward leakage (TIL) for low filtration masks including anti-yellow sand masks and quarantine masks.

We selected a total of forty four different models; anti-yellow sand mask, quarantine mask, medical mask, general mask, and handkerchief. The two TSI 8130 Automatic Filter Testers for EU and NIOSH protocol were used. 6 samples of each model were tested. For TIL test, five masks were selected. Wide variation of PE and PD was observed by mask types. Overall mean of PE and PD of all tested mask was  $35.6 \pm 34.7\%$ ,  $2.7 \pm 1.4$  mm H<sub>2</sub>O with EU protocol and  $35.1 \pm 35.7\%$ ,  $10.6 \pm 5.88$  mmH<sub>2</sub>O respectively with NIOSH protocol. The lowest average PE was measured in the quarantine mask, followed in order by the anti-yellow sand mask, the medical mask, the general mask and the handkerchief. No significant difference in PE was noted between the EU and the NIOSH protocol. However, the PDs were significantly different between mask types in both the EU and NIOSH protocol. TIL values of anti-yellow sand mask and quarantine mask were significantly higher than PE values. To reduce the risk for general citizens, we need to prepare and rearrange the test protocol for general masks used by general citizens.

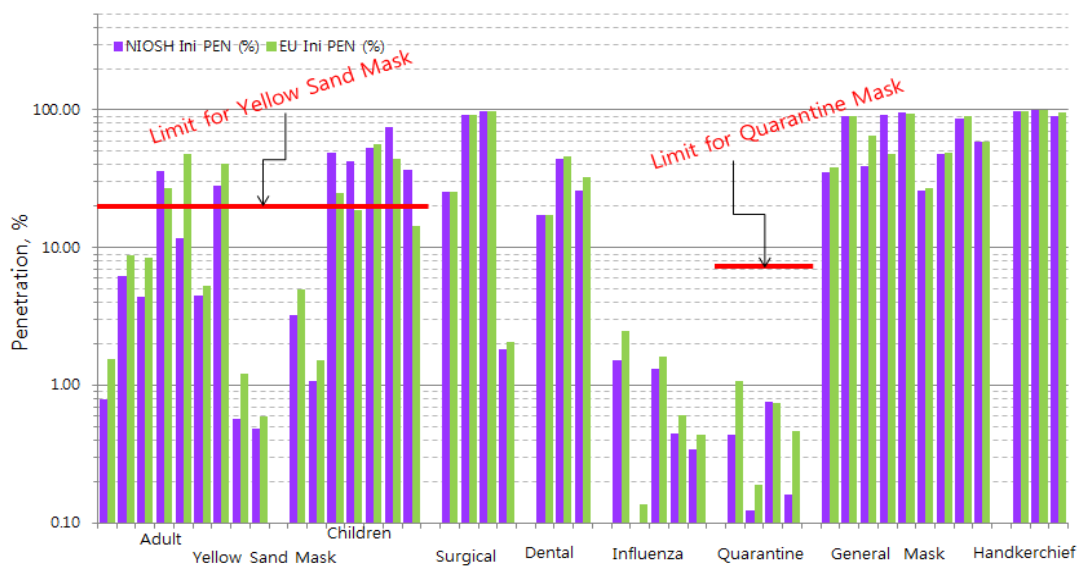


Figure 1. Filtration efficiency of tested masks using EU and NIOSH Protocol.

Keywords: Mask, Filtration efficiency, Pressure drop, Total inward leakage, MFDS, NIOSH.

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