Effectiveness of Filtering Facepiece Respirator with 3-D Facepiece Cushion

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Recently, WHO recommended the use of NIOSH N, R or P Class 95, 99 or 100 particulate respirator, or respirator considered its equivalent in the country of the manufacture, for preventive measure against SARS. This WHO recommendation develops an awareness of the use of filtering facepiece respirator, meeting this performance standard, among general people as well as workers in health care settings who use surgical masks. Important elements of performance of particulate respirator are filter efficiency and inward leakage through respirator periphery contacting the face of respirator wearer. However, a filtering facepiece provides a difficulty in effectively checking for proper fit in contrast to a respirator attached with replaceable filters.

For filtering facepiece, a higher fit is important. Three types of filtering facepiece, i.e. filtering facepiece with no facepiece cushion, filtering facepiece with planar facepiece cushion and filtering facepiece with 3-D configuration of facepiece cushion, were subject to man test for leakage in accordance with the national approval test of Japan. In this man test, also, particulate loading amount on the filtering surface was measured to determine the effective use of the filtering area. This test confirmed that the filtering facepiece with 3-D configuration of facepiece cushion used almost 100% of the filtering area in capturing particulate and was useful especially for the test subjects who resulted in high percent leakage on wearing filtering facepiece with planar facepiece cushion or no facepiece cushion.