

PROTECTION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL PROTECTION

Testing Of Particle Filtering Half Masks During The Coronavirus Pandemic

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The World Health Organization (WHO) declared that the coronavirus outbreak was a Public Health Emergency of International Concern on 30 January and a pandemic on 11 March 2020. Shortly after the outbreak, the Norwegian Ministry of Defence announced support to the civilian authorities as one of the top priorities for the defence sector during the pandemic.

The Norwegian Defence Research Establishment (FFI) continuously develops research-based knowledge, including test and evaluation of personal protective equipment against CBRN agents. With this knowledge, FFI adjusted existing equipment and procedures used primarily for the Norwegian Armed Forces, in order to support the health sector with quality control of respiratory protective devices (RPD), such as particle filtering half masks. Quality control for the national procurement scheme of RPD was necessary due to the limited availability for European Standard (EN) test laboratories, both nationally and internationally, during 2020–2021. Quality control was also performed by FFI for the development of a new national production capacity for particle filtering half masks.

EN 149 [1] specifies minimum requirements for filtering half masks as RPD to protect against particles. The standard describes both testing of individual components of a mask and comprehensive testing of the entire mask system. FFI performed the measurements of total inward leakage according to the standard with certain adaptations to adjust the standard procedure to the equipment at hand. Adaptations were made with respect to test agent and atmosphere, sampling interval and detection. The selection of test subjects was also an issue of discussion. A summary of the results for the over 90-tested particle filtering half masks showed that masks with ear loops did not provide satisfactory protection in accordance with tested requirements. Masks with headband straps were considerably better.

[1] EN 149:2001+A1:2009, Respiratory protective devices, Filtering half masks to protect against particles, Requirements, testing, marking, May 2009.