

REUSABILITY OF DISPOSABLE FILTERING FACEPIECE RESPIRATORS

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Concerns have been raised regarding the availability of disposable National Institute for Occupational Safety and Health (NIOSH)-certified filtering facepiece respirators (FFRs) during a pandemic. One strategy to alleviate a respirator shortage is to reuse the FFR following a biological decontamination process. However little data exists on the effect of decontamination methods on respirator integrity and performance and the ability of decontamination methods to remove the viral threat from the FFR. This presentation will provide an update on NIOSH research to address these knowledge gaps. The effect of decontamination on filtration efficiency was assessed using N95 surgical N95 and P100 FFRs that were treated with five decontamination processes (microwaves ultraviolet light bleach ethylene oxide and hydrogen peroxide). After decontamination 95.6% of the FFRs tested exhibited filtration performance commensurate with their NIOSH certification. Some FFR samples melted after microwave treatment. Methods have also been developed to reproducibly expose an FFR or FFR coupons to aerosolized virus (MS2 bacteriophage) to determine the effects of key parameters such as protective factors (e.g. proteins) and deposition method (droplet nuclei vs. wet droplets) on the ability of various decontamination methods (e.g. bleach UV steam) to render the trapped virus particles inactive. Preliminary results have shown that test procedures using both deposition methods can discriminate between decontamination methods of varying effectiveness and that protective factors can affect decontamination performance. While progress has been made on several aspects further studies are still necessary to determine if it is possible to reuse a disposable FFR after biological decontamination.