

EVALUATION OF THE FILTRATION PERFORMANCE OF 21 N95 FILTERING FACEPIECE RESPIRATORS AFTER PROLONGED STORAGE

Ronald E. Shaffer, Dennis J. Viscusi, Edward Sinkule, and Mike Bergman

National Institute for Occupational Safety and Health

Organizations throughout the world have begun stockpiling respirators to prepare for an influenza pandemic. To better understand the effects of prolonged storage this study evaluated the filtration efficiency of 21 different models of National Institute for Occupational Safety and Health (NIOSH)-certified disposable N95 filtering facepiece respirators. These respirators had been stored in their original packaging for a period of 6 to 10 years in research laboratories and dry warehouse facilities ranging in temperature between 15°C - 32°C and relative humidity between 20 - 80%RH. All sample respirators were tested using an abbreviated version of the NIOSH respirator certification test. Of the 21 respirator models tested 19 models had both average initial and maximum penetration results of less than 5%. Mean initial penetration values ranged from 0.39% to 5.83% while mean maximum penetration values ranged from 0.95% to 5.83%. Considering that (1) all respirators were stored in their original packaging and within cardboard boxes used for shipment and (2) all respirators experienced similar environmental storage conditions (temperature and humidity levels) any changes in filtration efficiency are likely model specific. There did not appear to be any connection between the length of storage and failure to pass the filtration test. Overall results indicate that most N95 filtering facepiece respirators stored for up to ten years at warehouse conditions will likely maintain their NIOSH-certified level of laboratory filtration performance.