

## PROTECTION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL PROTECTION

# Measuring Breakthrough Performance Of Chemical, Biological And Radiological (cbr) Gas Filter Media In Extreme High Humidity

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Naval Collective Protection Systems (CPS) rely on the M98 filter set to remove CBR threats from the airstream flowing into protected zones for ships and fixed site locations. Due to the extreme environments that CPS operate, the Navy requires the collection of M98 filter performance data in high humidity environments ( $\geq 80\%$  relative humidity (RH)). The relative humidity of the airstream, and thus the moisture content of the ASZM-TEDA gas filter media is known to affect performance against chemical warfare agents and toxic industrial chemicals. Typically, gas filter breakthrough testing has been performed at or below 80% RH. The CBR Defense Laboratory Sciences Branch at NSWC Indian Head presents the system and methods used to achieve and maintain a 90% RH airstream to challenge samples of ASZM-TEDA. In conjunction, a method was developed for dynamically tracking the adsorption and desorption of water into ASZM-TEDA. These methods can be applied to any benchtop-scale testing of current or next-generation filter media, and will improve future collective protection system test and evaluation.